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Report on the Podophthalmous Crustacea of the Mergui Archipelago, collected for the Trustees of the Indian Museum, Calcutta, by Dr John Anderson, F.R.S., Superintendent of the Museum. By Dr J. G. DE MAN, of Middleburg, Netherlands. (Communicated by Dr. JOHN ANDERSON, F.R.S., F.L.S.) 1

(PART I., with Plates I.–III.)

See Notice on last page of Wrapper.

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THE

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THE JOURNAL

OF

THE LINNEAN SOCIETY.

Report on the Podophthalmous Crustacea of the Mergui Archipelago, collected for the Trustees of the Indian Museum, Calcutta, by Dr. John Anderson, F.R.S., Superintendent of the Museum. By Dr. J. G. de Man, of Middleburg, Netherlands. (Communicated by Dr. John Anderson, F.R.S., F.L.S.)

[Read 17th June, 1886.]

(Plates I.-XIX.)

The Crustacea described in the following pages are mostly littoral species. The Collection contains no fewer than 166 species, 38 of which are new to science, *i. e.* nearly a fourth of the whole number. They are represented by about 1060 specimens, in an excellent state of preservation. 118 species are new to the Fauna of the Bay of Bengal (including Ceylon, the Nicobar Islands, and Singapore), only 48 species in the Collection having been previously recorded from that part of the Indian Ocean. These numbers are highly surprising, as the Bay of Bengal has been explored, years ago, by many naturalists. Large carcinological collections were made in former times by French naturalists on the coast of Coromandel and at Ceylon, and a still larger number of species were collected, in the years 1857–59, by the famous 'Novara' Expedition, at the same localities and especially at the Nicobar Islands. In the Report published in 1865, by Prof. Heller on the Decapoda and Stomatopoda collected during that expedition, no less than

109 species were enumerated from Madras, Ceylon, and the Nicobar Islands, a fifth of which were new to science. Scarcely more than a fourth of these 109 species occur in the Mergui Collection. The Decapodous and Stomatopodous Crustacea in this interesting Mergui Collection that are new to the Fauna of the Bay of Bengal prove to be about two thirds of the number of species hitherto known as inhabiting it! The species therefore of these two groups now ascertained to occur in the Bay amount to nearly 300.

These numbers are eloquent and demonstrate that the collection made by Prof. Anderson is a most interesting one, and a valuable contribution to the Fauna of the north-eastern part of the Indian Ocean.

The following table gives a summary of the number of species, of the new species, and of the specimens in the Collection, according to the subdivisions of the group:—

	Number of Species.	New Species.	Specimens.
Oxyrhyncha	9	3	21
Cyclometopa	48	5	205
Catometopa	47	17	540
Oxystomata	11	1	26
Anomura	26	5	144
Macrura	19	6	103
Stomatopoda	4	1	19
Pœcilopoda....................	2	...	3
	166	38	1061

These results show that the subtribe *Catometopa* contains comparatively the largest number of new species, and that more than a half of all the specimens belong to it.

The genera of *Catometopa* include many groups that are at present very insufficiently and unsatisfactorily known: I have only to refer to the genera *Telphusa*, *Ocypoda*, *Sesarma*, and *Gelasimus* as instances of the great confusion that still prevails regarding these common Indian forms. Only five years ago I first pointed out the distinctive characters of the common and widely distributed *Ocypoda cordimana*—a species at that time so unsatisfactorily known that it was almost impossible to distinguish it from allied forms, although it had been described more than half a century before!

This fact leads me to direct attention to the confusion that still exists regarding the synonymy of many common Indian Podophthalmous Crustacea. This circumstance may be accounted for by the fact that such authors as Milne-Edwards, de Haan, and Dana, when describing species of former carcinologists, *e. g.* of Fabricius and Herbst, had neither studied nor examined their typical specimens, preserved in the Museums of Kiel, Copenhagen, and Berlin; although the diagnoses of Fabricius and the descriptions and figures of Herbst were often too short or insufficient to enable the species to be satisfactorily recognized. A renewed examination of the typical specimens of these older carcinologists, so far as they are still available, appears to me to be most desirable.

I have made a beginning in this direction by examining the types of certain species described by Fabricius, Milne-Edwards, and some others, so far as this was necessary for the present Report; and I am now occupied with a critical study of the Australian species which were described about twenty years ago by Mr. Hess. I have given in the present Report some results of these studies, which I think will prove to be of value and contribute to a more exact knowledge of the common Indian Decapoda. I have also pointed out the distinctive characters of *Menippe Rumphii*, Fabr., and of *Myomenippe granulosa*, A. M.-Edw., both common species of large size, but which nevertheless were insufficiently known. I have furthermore given new and full descriptions of four common species of *Gelasimus*, and have elucidated the characters of the little-known group of *Metaplax* and those also of many species of the genus *Sesarma*, which are so extremely difficult to distinguish that great confusion regarding them is still observable in carcinological works.

The Collection made by Prof. Anderson contains, as already observed, a large number of interesting forms. I would especially call attention to the following species:—a new form of the rare Maioid genus *Harrovia*, two rare species of *Leptodius* (*L. nudipes* and *L. cavipes*), two species of *Heteropanope*; a large series of *Goniosoma merguiense* and of *Gelasimus*; two new forms of the singular genus *Dotilla*; the new genus *Dioxippe*; the rare and interesting forms of *Metaplax*; eight species of *Porcellana*; and, finally, the interesting species of Macrura.

Some common Indian genera, on the contrary, are not at all represented in the collection, *e. g.*, *Matuta*, *Palinurus*, and the *Hippidæ*.

Most species are represented by a small number of specimens. A few, however, are an exception and appear to have been very common at the Mergui Islands at the time the collection was made, as indicated in the following table:—

	Specimens.		Specimens.
Leptodius exaratus, M.-Edw.	25	*Gelasimus triangularis*, A.M.-Ed.	33
Goniosoma merguiense, n. sp.	20	*Dotilla intermedia*, n. sp.	32
Gelasimus Dussumieri, M.-Edw.	57	*Metaplax elegans*, n. sp.	29
—— *acutus*, Stimps.	67	*Sesarma Edwardsi*, n. sp.	66
—— *annulipes*, Latr.	33	*Porcellana picta*, Stimps.	25

The genus *Porcellana* is represented in the Bay of Bengal by no fewer than 15 species, 8 of which are in the collection.

Finally, I desire to take this opportunity of expressing my obligation to the following gentlemen, from whom I have received valuable assistance. I am especially indebted to Dr. F. A. Jentink, Director, and to Dr. R. Horst, Conservator, of the Zoological Museum of Leyden, for having permitted me to study a large series of interesting typical specimens preserved in that great Institution. My thanks are due to Mr. C. Ritzema, Conservator of the same Museum, for having kindly granted me the loan of many valuable carcinological works during the time I was working at this Collection; and also to Prof. Alph. Milne-Edwards, of Paris, to Prof. Möbius, of Kiel, and to Mr. C. Koelbel, of Vienna, for having permitted me to study a large number of typical specimens, described respectively by the late H. Milne-Edwards, by Fabricius, and in the 'Novara' Expedition. I have to express my thanks also to Dr. F. Meinert, of Copenhagen, for having graciously presented to me excellent life-size photographs of three species of Fabricius, the types of which are preserved in the Museum of Copenhagen; and to Dr. Hilgendorf, of Berlin, and to Dr. F. Richters, of Frankfort-on-the-Main, for having kindly compared for me specimens from Mergui with typical specimens of Herbst and Rüppell.

A. *List of Species collected in the Mergui Archipelago.*

DECAPODA.

BRACHYURA.

*Doclea hybrida, *Fabr.*
—— Andersoni, n. sp.
—— sp.
Hyastenus Hilgendorfi, n. sp.
—— Pleione, *Herbst.*
Naxia (Naxioides) Petersii, *Hilgend.*
*Schizophrys aspera, *H. M.-Edw.*
Micippa Haanii, *Stimps.*
*Lambrus longimanus, *H. M.-Edw.*
Harrovia elegans, n. sp.

*Atergatis integerrimus, *Lam.*
* —— floridus, *Rumph.*
Carpilodes Stimpsoni, *A. M.-Edw.*
Actæa areolata, *Dana.*
*—— rufopunctata, *H. M.-Edw.*
—— parvula, *de Haan.*
—— sp.
Euxanthus mamillatus, *H. M.-Edw.*
Xantho impressus, *Lam.*
Medæus distinguendus, *de Haan.*
*Chlorodius niger, *Forsk.*
—— sculptus, *A. M.-Edw.*
Leptodius exaratus, *H. M.-Edw.*
—— nudipes, *Dana.*
—— cavipes, *Dana.*
—— sp.
*Chlorodopsis pilumnoides, *Ad. & White.*
Cymo Andreossyi, *Aud.*
*Menippe Rumphii, *Fabr.*
Myomenippe granulosa, *A. M.-Edw.*
Eurycarcinus maculatus, *A. M.-Edw.*
*Ozius tuberculosus, *H. M.-Edw.*
*Epixanthus frontalis, *H. M.-Edw.*
—— dentatus, *White.*
Actumnus setifer, *de Haan.*
—— elegans, n. sp.
*—— nudus, *A. M.-Edw.*
Heteropanope indica, n. sp.
—— eucratoides, *Stimps.*
Pilumnus vespertilio, *Fabr.*
—— Andersoni, n. sp.
—— seminudus, *Miers.*
—— lævis, *Dana.*
*Eriphia lævimana, *Latr.*
*Trapezia cymodoce, *Herbst.*
*Neptunus pelagicus, *L.*
?—— gladiator, *Fabr.*
—— Andersoni, n. sp.
Thalamita Savignyi, *A. M.-Edw.*
—— integra, *Dana.*
*Thalamita sima, *H. M.-Edw.*
—— prymna, *Herbst.*
—— spinimana, *Dana.*
—— Danæ, *Stimps.*
*—— crenata, *Latr.*
*Goniosoma cruciferum, *Fabr.*
* —— affine, *Dana.*
—— merguiense, n. sp.

Eucrate affinis, *Hasw.*
Carcinoplax setosus, *A. M.-Edw.*
—— integer, *Miers.*
*Telphusa Stoliczkana, *Wood-Mason.*
—— Callianira, n. sp.
—— carinifera, n. sp.
Pinnotheres Edwardsi, n. sp.
—— parvulus, *Stimps.*
Xanthasia murigera, *White.*
—— sp.
*Ocypoda ceratophthalma, *Pall.*
*—— cordimana, *Latr.*
Gelasimus Dussumieri, *H. M.-Edw.*
—— acutus, *Stimps.*
*—— annulipes, *Latr.*
* —— triangularis, *A. M.-Edw.*
Macrophthalmus tomentosus, *Eyd. & Soul.*
—— depressus, *Rüpp.*
—— Erato, n. sp.
Dotilla brevitarsis, n. sp.
—— intermedia, n. sp.
Dioxippe orientalis, n. gen. et n. sp.
*Metopograpsus messor, *Forsk.*
—— maculatus, *H. M.-Edw.*
*Grapsus strigosus, *Herbst.*
Pachygrapsus minutus, *A. M.-Edw.*
Pyxidognathus Deianira, n. sp.
Metaplax crenulatus, *Gerst.*
—— distinctus, *H. M.-Edw.*
*—— dentipes, *Heller.*
—— elegans, n. sp.
—— intermedius, n. sp.
Sesarma Aubryi, *A. M.-Edw.*
*—— aspera, *Heller.*
—— Melissa, n. sp.
—— picta, *de Haan.*
—— Andersoni, n. sp.
—— Haswelli, n. sp.
—— Dussumieri, *H. M.-Edw.*
?—— livida, *A. M.-Edw.*
—— tæniolata, *White.*
—— intermedia, *de Haan.*

Sesarma Edwardsi, n. sp.
—— ——, var. crassimana, n.
—— polita, n. sp.
—— Kraussi, n. sp.
—— sp.
Clistocœloma merguiensis, n. sp.

*Calappa philargius, *L.*
*—— gallus, *Herbst.*
Leucosia urania, *Herbst.*
? Pseudophilyra Hoedtii, *de M.*
—— Melita, n. sp.
*Philyra scabriuscula, *Fabr.*
—— platycheira, *de Haan.*
—— globosa, *Fabr.*
Myra punctata, *Herbst.*
*Dorippe quadridens, *Fabr.*
—— sp.

ANOMURA.

Dromidia unidentata, *Rüpp.*, var.
—— cranioides, n. sp.
Cryptodromia, sp.
*Porcellana inermis, *Heller.*
—— japonica, *de Haan.*
*—— dentata, *H. M.-Edw.*
—— Boscii, *Aud.*
—— sculpta, *H. M.-Edw.*
—— corallicola, *Hasw.*
—— picta, *Stimps.*
—— Euphrosyne, n. sp.
*Pagurus punctulatus, *Oliv.*
—— deformis, *H. M.-Edw.*
Calcinus terræ-reginæ, *Hasw.*
Diogenes merguiensis, n. sp.
*—— miles, *Fabr.*
*—— avarus, *Heller.*
—— sp.
*Clibanarius infraspinatus, *Hilgend.*
—— padavensis, n. sp.
—— virescens, *Krauss.*
—— æquabilis, *Dana*, var. merguiensis, n.
—— Arethusa, n. sp.
—— sp.
—— sp.
*Cœnobita violascens, *Heller.*

MACRURA.

Gebia carinicauda, *Stimps.*
Gebiopsis intermedia, n. sp.
*Thalassina anomala, *Herbst.*
*Thenus orientalis, *Fabr.*
Alpheus brevirostris, *Oliv.*
—— rapax (*Fabr.*), *de Haan.*
*—— Edwardsii, *Aud.*
—— Hippothoe, n. sp.
*—— minor, *Say*, var. neptunus.
—— ——, var. biunguiculatus.
Nica macrognatha, *Stimps.*
Harpilius Miersi, n. sp.
Hippolyte oligodon, n. sp.
*Palæmon carcinus, *Fabr.*
—— acutirostris, *Dana.*
*—— equidens, *Dana.*
*Penæus semisulcatus, *de Haan.*
—— sculptilis, *Heller.*
—— merguiensis, n. sp.
—— Lysianassa, n. sp.

STOMATOPODA.

*Squilla nepa, *Latr.*
*—— raphidea, *Fabr.*
Pseudosquilla pilaensis, n. sp.
*Gonodactylus chiragra, *Fabr.*

PŒCILOPODA.

Limulus moluccanus, *Latr.*
Limulus rotundicauda, *Latr.*

[N.B.—In the foregoing list those species which have been previously observed in other parts of the Bay of Bengal (on the coast of Coromandel, at Ceylon, at the Nicobar Islands) and at Singapore are marked with an asterisk.]

B. *List of Species recorded from the Bay of Bengal* (coast of Coromandel, Ceylon, Nicobar Islands) *and Singapore*, which are not represented in the Mergui Collection.

The species in the following list which are *not* marked with an asterisk were collected during the years 1857–59 by the 'Novara' Expedition, and have been described by Dr. Heller; those which are marked with an asterisk have been recorded by MM. H. and A. Milne-Edwards and others.

*Egeria arachnoides, *Latr.*
*Chorinus aries, *Latr.*
Micippa hirtipes, *Dana.*
Tiarinia verrucosa, *Heller.*
Acanthonyx consobrinus, *A. M.-Edw.*
*Lambrus echinatus, *H. M.-Edw.*
*—— deflexifrons, *Miers.*
*—— Holdsworthi, *Miers.*
*—— hoplonotus, *Ad. & White.*
—— ——, var. planifrons, *Miers.*
*—— carenatus, *H. M.-Edw.*
Xantho Lamarckii, *H. M.-Edw.*
—— notatus, *Dana.*
—— granosomanus, *Dana.*
*Carpilodes rugatus, *H. M.-Edw.*
Etisus utilis, *Hombr. & Jacq.*
*—— lævimanus, *Rand.*
Actæodes tomentosus, *H. M.-Edw.*
—— nodipes, *Heller.*
Leptodius sanguineus, *H. M.-Edw.*
Pilodius pugil, *Dana.*
Ozius rugulosus, *Stimps.*
Trapezia cærulea, *Rüpp.*
—— areolata, *Dana.*
*—— ferruginea, *Latr.*
*—— rufopunctata, *Herbst.*
Neptunus sanguinolentus, *Herbst.*
*Achelous granulatus, *H. M.-Edw.*
Scylla serrata, *Forsk.*
Thalamita Admete, *Herbst.*
—— cæruleipes, *Luc. & Jacq.*
Goniosoma sexdentatum, *Herbst.*
* —— natator, *Herbst.*
—— annulatum, *Fabr.* (=orientale, *Heller, nec Dana*).
*—— rostratum, *A. M.-Edw.*
*Lissocarcinus polybioides, *Ad. & White.*
*Macrophthalmus transversus, *Latr.*
*Macrophthalmus carinimanus, *Latr.*
*—— lævimanus, *H. M.-Edw.*
—— bicarinatus, *Heller.*
Gelasimus vocans, *Rumph.*
—— tetragonon, *Herbst.*
—— rubripes, *Luc. & Jacq.*
Ocypoda platytarsis, *H. M.-Edw.*
—— macrocera, *H. M.-Edw.*
Metopograpsus oceanicus, *Luc. & Jacq.*
*Grapsus maculatus, *Catesby.*
—— rudis, *H. M.-Edw.*
*Geograpsus Grayi, *H. M.-Edw.*
*Plagusia tuberculata, *Lam.*
*—— immaculata, *Lam.*
Acanthopus planissimus, *Herbst.*
Varuna litterata, *Fabr.*
Pseudograpsus barbatus, *Rumph.*
Cyclograpsus punctatus, *H. M.-Edw.*
Nectograpsus politus, *Heller.*
Grapsodes notatus, *Heller.*
Ptychognathus pusillus, *Heller.*
Sesarma Eydouxi, *H. M.-Edw.*
—— bidens, *de Haan*[†].
—— indica, *H. M.-Edw.*
—— gracilipes, *H. M.-Edw.*
Calappa tuberculata, *Fabr.*
—— lophos, *Herbst.*
Matuta victrix, *Fabr.*
*—— picta, *Hess.*
*—— lunaris, *Herbst.*
*Leucosia craniolaris, *L.*
*—— brunnea, *Miers.*
*Cryptocnemus Holdsworthi, *Miers.*
Albunea symnista, *Fabr.*
Remipes testudinarius, *H. M.-Edw.*
Hippa asiatica, *H. M.-Edw.*
Porcellana pisum, *H. M.-Edw.*
—— pisoides, *Heller.*

[†] It is with much hesitation that I include this species in the list. Heller records it; but I have little doubt that his specimen belonged to *Sesarma Haswelli*, n. sp.

Porcellana Danæ, *Heller*.
—— scabriuscula, *Dana*.
—— militaris, *Heller*.
—— penicillata, *Heller*.
—— barbata, *Heller*.
Cœnobita clypeata, *Herbst*.
—— rugosa, *H. M.-Edw*.
—— Olivieri, *Owen*.
Calcinus tibicen, *Herbst*.
—— Gaimardi, *H. M.-Edw*.
Clibanarius striolatus, *Dana*.
—— corallinus, *H. M.-Edw*.
—— humilis, *Dana*.
—— longitarsis, *de Haan*.
*Pagurus affinis, *H. M.-Edw*.
Paguristes ciliatus, *Heller*.
Palinurus dasypus, *H. M.-Edw*.
*Scyllarus rugosus, *Latr*.
Alpheus lævis, *Rand*.
Alpheus charon, *Heller*.
*—— comatulorum, *Hasw*.
Anchistia notata, *Heller*.
*Leander longirostris, *H. M.-Edw*.
—— distans, *Heller*.
Palæmon rudis, *Heller*.
—— scabriculus, *Heller*.
—— lanceifrons, *Dana*.
Hippolyte gibbosus, *H. M.-Edw*.
*Sicyonia ocellata, *Stimps*.
Penæus monoceros, *Fabr*.
—— indicus, *H. M.-Edw*.
—— monodon, *Fabr*.
—— avirostris, *Dana*.
*Acetes indicus, *H. M.-Edw*.
*Squilla scorpio, *Latr*.
*Gonodactylus glyptocercus, *Wood-Mason*.

Order DECAPODA.

Tribe BRACHYURA.

Subtribe *Oxyrhyncha*.

Family INACHIDÆ.

Genus DOCLEA, *Leach*.

The genus *Doclea*, although known since the beginning of the century, belongs nevertheless to a group of Decapods which stands greatly in need of revision. Little doubt can be entertained that some species, formerly described by Bleeker † and by Stimpson, will ultimately prove to be identical when a large series of individuals of different sizes and ages are compared together. Mr. Miers ‡, the well-known and zealous English carcinologist, seems to hold the same opinion, for he has already united some species.

The Mergui Collection contains four specimens of *Doclea*, which belong to three different species, one of which is new.

---

† 'Recherches sur les Crustacés de l'Indo Archipélagique,' Batavia, 1856.

‡ Annals & Mag. Nat. Hist. 1880, ser. 5. vol. v. p. 226.

1. DOCLEA HYBRIDA, *Fabr.*

Inachus hybridus, *Fabricius, Supplementum Entomologiæ systematicæ*, Hafn. 1798, p. 355.

Doclea hybrida, *Milne-Edwards, Histoire Naturelle des Crustacés*, t. i. 1834, p. 294.

(Compared by me with the typical specimen of Fabricius, preserved in the Museum of the University of Kiel.)

One fine female specimen was collected at Sullivan Island.

The length of the cephalothorax* measures about 35 millim., while the breadth amounts to 34 millim., the lateral spines being excluded. The cephalothorax, which appears nearly circular, has an extremely convex and semiglobular upper surface, which bears many dentiform tubercles, the woolly down with which this species is covered is only observed in this specimen near the antero-lateral margins The rostrum, which is a little broken off at the tip, is short, though not shorter than that of *Doclea ovis*, as figured in Milne-Edwards's 'Règne Animal de Cuvier,' plate 33; it is 6 millim. long from the tip to a transverse line which unites the two internal angles of the fissures that are found in the upper margins of the orbits, while this transverse line, which I regard as the base of the rostrum, is itself 9 millim. long. The antero-lateral margins are armed with four rather short though acute spines; the second spine is the smallest, the third is a little longer than the first, and the last spine is still somewhat longer and larger than the third, measuring 3½ millim., directed transversely outward (not forward), and being exactly equidistant from the external orbital angle and the base of the spine with which the posterior margin of the carapace is armed. The latter spine is very short, measuring only 2 millim., so that it is as long as the third antero-lateral spine and directed horizontally backwards. The interregional grooves on the upper surface of the cephalothorax are rather strongly marked, so that the regions are very distinct. The upper surface of the cephalothorax is armed with many short, rather obtuse, dentiform tubercles, which are arranged in the following manner:—First, seven tubercles of equal size are placed in a longitudinal row on the median line of the upper surface, viz. five on the gastric, one on the cardiac, and one on the anterior part of the intestinal region

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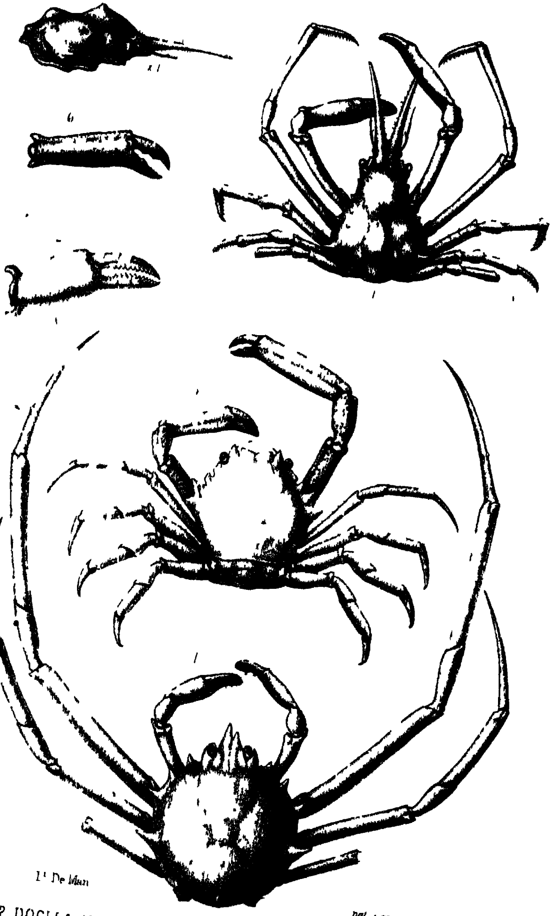
* Longitudinal distance from the posterior margin to a line which unites the eyes, so that the rostrum and the spine of the posterior margin are excluded.

The posterior tubercle of the five of the gastric region, that stands on the middle of the urogastric lobe, is situated exactly in the centre of the circular cephalothorax; its distance from the next median gastric tubercle is greater than the distance of the latter from the third, while the distances between the three anterior tubercles are still somewhat smaller. Immediately before the foremost median gastric tubercle, two still more depressed rounded tubercles are found, situated close to one another in a transverse line and occupying the epigastric lobes. The protogastric lobes present a very small tubercle, placed on the side of and immediately behind the second gastric tubercle, and two or three other scarcely perceptible prominences more laterally. Each of the hypogastric lobes is also provided at its anterior angle with a very small tubercle equal in size to that of the protogastric lobes, and therefore also smaller than the median gastric prominences. Finally, some more or less acute tubercles are found on the hepatic, epi- and mesobranchial lobes.

As regards the under surface of the carapace, I may remark that it is wholly covered with the down which occurs in so many species of this genus, except the postabdomen, which is nearly smooth. The antero-lateral angles of the buccal cavity are armed with two nearly equal small spines, which are even a little shorter than the first antero-lateral spine of the carapace, being about the same size as the second. The postabdomen is composed of seven segments, of which the fourth, fifth, and sixth are coalescent; their outer surface is minutely punctate, but the rest are smooth.

The chelipedes are equal and a little shorter than the cephalothorax, being about 32 millim. long; the convex outer and inner surfaces of the hands are smooth, though minutely punctate, and the fingers nearly meet along their whole inner margins, presenting some small tufts of very short hairs on their outer and inner surfaces. In the male of this species the chelipedes are considerably larger. The legs of the second pair, measuring about 66 millim., are somewhat shorter than twice the length of the cephalothorax; in the adult male they are, however, a little longer than twice the length of the cephalothorax, according to Fabricius's type. The other legs successively decrease in length. The legs are everywhere covered with a close down, except the terminal ends of the dactylopodites.

This specimen agrees perfectly with the typical specimen of *Inachus hybridus*, Fabr., except as regards the fourth (or last)



J. De Man

nat. size

1, 2 DOCLEA ANDERSONI   3, 4 HYASTENUS HILGENDORFI antero-lateral spine, which in the typical specimen is the same size as the third, and in which it is directed slightly forward and upward. I, however, regard this small difference only as sexual, local, or individual.

As regards *Doclea hybridoida*, Blkr., I suppose it to be a mere variety of *Doclea hybrida*, characterized by the rudimentary state of the tubercles of the branchial regions.

Doclea hybrida having been recorded also from the coast of Coromandel, would appear to inhabit the north-eastern part of the Indian Ocean.

2. DOCLEA ANDERSONI, n. sp. (Pl. I. figs. 1 & 2.)

A single adult specimen was collected at Sullivan Island, together with the preceding species.

This new species closely resembles the *Doclea* figured by Seba (Thesaurus &c. t. iii. p. 41, tab. xvii. fig. 4), and I suppose it to be the same. The specimen from Sullivan Island, however, does *not* agree with Bleeker's description of *Doclea Sebæ*, Blkr., a species founded upon the same figure, as its upper surface is not armed with spines. Bleeker has pointed out that whereas the specimens he referred to *D. Sebæ* had spines, these structures are not found in the figure given in the 'Thesaurus.'

The cephalothorax is 29 millim. long (without the rostrum and the posterior spine) and 30 millim. broad (without the lateral spines). Presenting thus the same circular form as *Doclea hybrida*, our species at first sight may be distinguished by its much lower, less convex, more depressed cephalothrax. The cephalothorax, which in *D. hybrida* is semiglobular, in our new species is more disk-shaped. The whole (upper and under) surface is densely covered with a short woolly down. The rostrum has the same form and size as that of *D. hybrida*, extending as much forwards. The antero-lateral margins are armed with four rather acute short spines, which are arranged in the same manner as in the preceding species; the three anterior ones are nearly equally long, viz. 2–2½ millim., but the posterior tooth is a little longer (3½ millim.) and directed slightly forward and upward. This latter spine measures about half the breadth of the base of the rostrum (the transverse line that unites the internal angles of the supra-orbital fissures). The posterior margin of the carapace is armed with a median acute spine, directed backward and slightly upwards, which is nearly as long as the last antero-lateral spine. Though the regions of the carapace are still distinctly indicated, the upper surface, however, appears less uneven than in *D. hybrida*, and nowhere presents dentiform tubercles except in the median line, where two minute scarcely prominent tubercles are found, one in the middle of the mesogastric and one nearly in the middle of the anterior cardiac region.

In its essential characters the under surface of the cephalothorax nearly resembles that of *D. hybrida*; but the two spines which in the latter are found on the sternum, between the legs of the second pair, are rudimentary or wanting in *D. Andersoni*.

The anterior legs or chelipedes, measuring 36 millim., are a little longer than the carapace. Regarding their form and structure they almost wholly resemble those of *D. hybrida*, the fingers nearly meeting along their whole inner margins; but the convex outer and inner surfaces of the hands are not only minutely punctate but also minutely granulate, when they are examined under a magnifying-glass; the palm is 9 millim. long and 4½ millim. high, the fingers measuring 7 millim. As in *D. hybrida*, the fingers are covered on their outer and inner surfaces with some small tufts of very short hairs.

The legs of the second pair are 110 millim. long, and thus measure nearly four times the length of the carapace; as regards the shape and the relative length of their joints, I refer to the figure (Pl 1. fig. 1) or to that of Seba's 'Thesaurus.' The other legs are wanting. Except the propodites and the dactylopodites, the legs are everywhere covered with a close down.

Professor Anderson kindly compared for me this species with the type specimen of *D. Rissonii*, Leach, which is preserved in the British Museum, and he informs me that the lateral spines of the cephalothorax of *D. Rissonii* are fewer and not so strong as in our new species, that in *D. Rissonii* there are only ***three*** short spines on each side of the carapace, and that the posterior is the shortest. The median spine, which occurs on the posterior margin, is also feebler in the *Doclea* of Leach. As regards the ambulatory legs, the two species agree in many points. The cephalothorax of the type of *D. Rissonii* in the British Museum is 35¼ millim. long, and the legs of the second pair are respectively 123 and 130 millim. long, so that, as in *D. Andersoni*, they are nearly four times as long as the cephalothorax.

Doclea Andersoni may be distinguished from *D. hybrida*, Fabr., by the less elevated, disciform cephalothorax, by the shape and direction of the spines of the antero-lateral and posterior margins, by the upper surface of the carapace being scarcely tuberculate, by the minutely granulate hands, and, finally, by the much more elongated legs.

I have much pleasure in dedicating this new *Doclea* to Professor Anderson.

3. DOCLEA, sp.

The Collection contains two other much smaller male specimens of a *Doclea*, also collected in the Mergui Archipelago.

These *Docleæ* are somewhat allied to the former species, but may be distinguished by the following characters:—first, the three anterior teeth of the antero-lateral margins are rather obtuse, being, however, also equal in length, but the last spine is comparatively much longer; secondly, the two minute, scarcely prominent median tubercles with which the upper surface of the cephalothorax of *D. Andersoni* is provided are represented in these specimens by two rather strong spines; and, thirdly, the second pair of legs are comparatively shorter than in that species.

As regards the shape of the carapace and the relative length and shape of the joints of the ambulatory legs, these specimens closely resemble *D. Andersoni*. The cephalothorax of the larger individual is 16 millim. long and 17 millim. broad; the three anterior teeth of the antero-lateral margins are scarcely 1 millim. long, but the acute posterior tooth, which is directed slightly forward and upward, measures 3¼ millim. The legs of the second pair, measuring 54 millim., are only a little longer than three times the length of the cephalothorax.

The carapace of the younger specimen is only 8½ millim. long and 9 millim. broad. In this individual the two median spines, on the middle of the upper surface of the cephalothorax, are comparatively still longer, and the last tooth of the antero-lateral margins is 3 millim. long, so that it measures about a third of the breadth of the carapace. The second pair of legs are 25 millim. long, and thus precisely three times as long as the length of the cephalothorax. The median spine of the posterior margin is comparatively as long in these specimens as in *D. Andersoni*.

Finally I may add that in these specimens, as in the preceding species, the upper surface of the cephalothorax, especially of the antero-lateral regions, presents some longer yellowish hairs among the dense down with which it is covered.

I do not venture to describe these specimens as a new species, as they are apparently very young.

As regards *Doclea muricata*, Fabr., of which I was enabled to examine the typical specimen preserved in the Museum of the University of Kiel, I will observe that this species is closely allied to *D. hybrida*. It differs, however, first, by the armature of the upper surface of the cephalothorax, the dentiform tubercles of *D. hybrida* being substituted in *D. muricata* by acute and longer spines; and, secondly, by the fourth antero-lateral spine being nearly twice as long as the third. The chelipedes of the male are, moreover, comparatively smaller. As regards the shape of the cephalothorax and the form and the length of the ambulatory legs, *Doclea muricata* much resembles *D. hybrida*, the legs of the second pair being even in the male a little shorter than twice the length of the cephalothorax.

Genus HYASTENUS, *White*.

4. HYASTENUS HILGENDORFI, n. sp.* (Pl. I. figs. 3 & 4.)

(Compared by Dr. Hilgendorf, of the Zoological Museum of Berlin, with the typical specimens of *Hyastenus Pleione*, Herbst.)

Four specimens (2 ♂, 2 ♀) of this new species are in the Collection, of which two (♂ ♀) were collected at Elphinstone Island and two (♂ ♀) at King Island Bay.

This new *Hyastenus* is closely allied to *Hyastenus Pleione*, Herbst. Dr. Hilgendorf, kindly compared for me one of the four specimens, a male, which I had sent him, with the (four) typical specimens of Herbst's *Cancer Pleione* and communicated to me the characters by which this new species differs from that of Herbst. I therefore have much pleasure in dedicating this *Hyastenus* to the learned carcinologist of Berlin. As regards its outer appearance, our new species much resembles *H. Pleione*, Herbst, and *H. diacantha*, de Haan; it may, however, easily be distinguished by the longer spines of the rostrum, and from Herbst's species moreover by the direction of these spines.

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* I was unable to compare the description of *Lepidonaxia Defilippii* of Targioni-Tozzetti, a species described in 1877 in the 'Zoologia della Magenta'; according to Mr. Miers, however, this species may probably be regarded as a mere variety of *H. oryx*, A. M.-Edw. (Zoology of H.M.S. 'Alert,' 1884, p. 195).

The cephalothorax is subpyriform, triangular, much more narrowed anteriorly than the cephalothorax of *H. oryx*, A. M.-Edw., and even a little more than that of *H. Pleione*. In the largest specimen (which I am describing) the proportion of the length* of the cephalothorax to the distance between the external angles of the orbits is as 9 to 4, whereas in *H. Pleione* it is as 5 to 2. In the new species the proportion of the length of the cephalothorax to the breadth (measured a little before the lateral epibranchial spines, where the carapace is broadest) is as 15 to 13. The gastric and the anterior cardiac regions are each elevated into a convex, rounded tubercle, both of which are about equally prominent. Between these two tubercles a small median transverse tubercle occurs in *H. Pleione,* which is not found in this species. The posterior cardiac region also rises into a small blunt median tubercle, directed obliquely backwards, and on each side of it an elevated line is observed running parallel with the posterior margin of the cephalothorax.

In *H. Hilgendorfi* there is no median longitudinal series of spines on the upper surface of the cephalothorax. In *H. Pleione,* on the contrary, the posterior cardiac region rises into an acute spine. Immediately behind the imaginary line which unites the fissures of the supraorbital margins with one another, in *H. Pleione* five small, blunt, semiglobular tubercles or spines are found on the anterior declivity of the great gastric tubercle, arranged in an arcuate line; in our new species only the two lateral tubercles of this group are found, while the three middle ones are almost completely wanting. The epibranchial spine, with which each side of the cephalothorax is armed behind the middle of the lateral margins, in our species is comparatively much stronger, acute, and curved upwards; an imaginary line, which unites the bases of the two epibranchial spines with one another, crosses the posterior declivity of the anterior cardiac region. Between the anterior cardiac tubercle and the epibranchial spines two small, scarcely prominent, blunt tubercles are found on each side of the former, lying in an oblique direction; two imaginary lines, which unite the tubercles of each pair, meet one another posteriorly at the tubercle of the posterior cardiac region. The anterior one of these two tubercles, that lies on the mesobranchial region, is rather acute in *H. Pleione*, and the posterior, though also blunt and obtuse, is nevertheless more prominent in Herbst's species. The epibranchial lobes, which are situated on each side of the cervical suture, are provided in *H. Hilgendorfi* each with two small, little prominent, obtuse tubercles, lying behind one another; in *H. Pleione* these two tubercles are conical and acute. Immediately behind the external angles of the orbits a small dentiform, rather obtuse tubercle is found on the hepatic region of the cephalothorax, which also occurs in *H. Pleione*. The lateral sides of the upper surface of the cephalothorax are moreover armed in our species, as in *Pleione*, with some small dentiform tubercles, which are situated behind the tubercles of the epibranchial and hepatic regions and the bases of the legs, close to the latter. One of these dentiform tubercles is found, in both species, quite above the base of the chelipedes; behind this tubercle in *H. Hilgendorfi* four small dentiform tubercles occur, whereas in *H. Pleione* there are only two. I may add that these four tubercles are arranged rather irregularly and that they are often of a somewhat different size. Between the external angle of the anterior margin of the buccal cavity and the dentiform tubercle, which is found above the base of the anterior legs, in both species, two other dentiform tubercles occur, the anterior of which is twice as broad as the posterior.

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* The length of the carapace is the distance between the posterior margin of the cephalothorax and a transverse imaginary line, which unites the anterior angles of the supraorbital margins.

The spines of the rostrum are comparatively a little longer than those of *H. Pleione* (Dr. Hilgendorf informs me that the rostral spines have been drawn too long in Herbst's figure of *H. Pleione* (pl. lviii. fig. 5). In the male of our species the proportion of the length of the cephalothorax to the distance of the two parallel imaginary lines, which unite respectively the tips of the rostral spines and the anterior angles of the supraorbital margins, is as 15 to 11¼; in the female individuals this proportion is as 15 to 7½. The rostral spines are thus comparatively shorter in the female: but I may observe that this condition may perhaps be ascribed to the younger age of the female specimens, which are much smaller than the male. The rostral spines are quite as divergent as those of *H. oryx* (Nouv. Arch. du Muséum Hist. Nat. t. viii pl. 14. fig. 1). In *H. Hilgendorfi* the rostral spines are directed nearly horizontally forward, so that they make a very obtuse angle with the anterior declivity of the gastric region. In *H. Pleione*, on the contrary, the spines are directed more downwards, so that they are situated in the prolongation of the oblique surface of the anterior declivity of the gastric region When the tips of the two rostral spines are united by an imaginary line and the antero-internal angles of the supraorbital margins by another, the proportion of the distance between these two imaginary lines to the distance between the antero-internal angles of the supraorbital margins is as 8 to 3; in the smaller female individuals this proportion is as 5 to 3, because the rostral spines are comparatively shorter. The basal antennal joint is a little narrower in this species than in *H. Pleione*, and its external margin is also of a somewhat different shape. In Herbst's species the epistome is comparatively a little shorter, and it therefore appears a little more enlarged; in this species (the male) the epistome is 1½ millim long, and the distance between the postero-internal angles of the orbits is 4½ millim., and therefore three times as broad as the length of the epistome. Immediately behind the postero-internal orbital angles a small dentiform tubercle is found, lying between these angles and the antero-external angles of the buccal cavity. The penultimate joint of the peduncle of the external antennæ is twice as long as the terminal joint. The outer maxillipeds and the male abdomen much resemble those of *H. oryx*.

The chelipedes are scarcely longer than the length of the body (the spines of the rostrum included) The upper margin of the arm is provided above, at the proximal extremity, with two dentiform tubercles situated very near to one another. The wrist presents a small tubercle at its internal angle, and one or two on its upper surface. The hands are rather slender, being nearly five times as long as high, the fingers (which are about half as long as the palm) included. The scarcely sinuous upper and under margins of the palm are parallel to one another; the hands are quite smooth and glabrous. The inner edges of the fingers are minutely denticulate and a little gaping at the base.

The ambulatory legs much resemble those of *H. oryx*. Those of the first pair are about once and a half as long as the whole body, and the other legs are successively shorter; so that the ambulatory legs of the last pair are only once and one third the length of the cephalothorax (exclusive of the rostral spines).

The dactylopodites are armed with a row of acute spinules along their inner margins; these spinules gradually increase in length towards the tip.

In the smaller (female) specimens the anterior legs are comparatively smaller.

In *H. Pleione* the hands of the male are a little shorter in proportion to the length of the cephalothorax than in this species, and they also present a somewhat less slender form.

The body of this *Hyastenus* is covered with a short pubescence on which some longer curved hairs are distributed; similar longer hairs also occur on the spines of the rostrum and on the ambulatory legs.

Dimensions of the larger male specimen:—

	millim.
Length of the whole body	26½
Length of the cephalothorax	15
Distance between the external orbital angles	6½
Breadth of the cephalothorax	13
Distance between the antero-internal angles of the supraorbital margins	4¼
Distance between the tips of the spines of the rostrum	7
Length of the anterior legs	30
Length of the hands (the fingers included)	12½
Length of the first pair of ambulatory legs	39
Length of the last pair of ambulatory legs	20

5. HYASTENUS PLEIONE, *Herbst.*

Cancer Pleione, *Herbst, Naturgeschichte der Krabben und Krebse,* t. iii. p. 52, Taf. lviii. fig. 5.

Naxia Pleione, *Gerstäcker, Carcinologische Beiträge,* 1856, p. 114, Taf. v. figs. 1 & 2.

Hyastenus Pleione, *A. Milne-Edwards, Nouv. Arch. du Muséum Hist. Nat.* t. viii. p. 250.

The Collection contains four small specimens of a *Hyastenus*, which I refer to Herbst's *H. Pleione*, as they present almost all the characters of this species, communicated to me by Dr. Hilgendorf. These individuals were collected at Sullivan Island.

The largest specimen is only 15 millim. long (the rostral spines included); a female, already bearing eggs, is only 10 millim. long, including the spines of the rostrum. The spines of the rostrum are directed downward, so that they lie in the prolongation of the oblique surface of the anterior declivity of the gastric region. In the largest specimen (15 millim. long), a male, the cephalothorax is 10 millim. long; so that the proportion of the length of the cephalothorax to that of the rostral spines is nearly as 15 to 7, whereas in *H. Hilgendorfi* this proportion is as 15 to 11¼; the spines are thus comparatively much longer in this species. The posterior cardiac lobe rises into an acute spine.

Genus Naxia, *M.-Edw.*

6. Naxia (Naxioides) Petersii, *Hilgendorf.*

Podopisa Petersii, *Hilgendorf, Monatsb. Acad. Wissensch. Berlin*, Nov. 1878, p. 785, Taf. i. fig. 1–5.

Naxia (Naxioides) Petersii, *Miers, Report on the Zool. Collections made in the Indo-Pacific Ocean during the Voyage of H.M.S. 'Alert,'* 1884, p. 523.

A young female specimen of this species was forwarded to Dr. Anderson from the Andaman Islands, and I therefore include it. As it agrees completely with Hilgendorf's description and figure, I will only add the following remarks:—The spine on the intestinal region appears rather obtuse, whereas in Hilgendorf's adult specimen it is more acute. As in his specimen, the spines of the rostrum seem to be broken off; they have almost the same length, are nearly parallel to one another, and are comparatively shorter than in the specimen in the Berlin Museum, for they do not reach as far forward as the peduncle of the external antennæ. Each spine is armed on its dorsal surface with a very small accessory spine, somewhat as in *Naxioides hirta*, A. M.-Edw. These antennal peduncles, which in the Berlin specimen were unequally developed, are quite equal to one another in the Andaman specimen; their terminal joint is little more than half as long as the penultimate joint, and the flagella are scarcely so long as the two terminal joints taken together. The flagella bear a few long hairs on their inner side; and the two last joints of the peduncle are clothed with many hooked hairs.

The anterior legs are comparatively much smaller than in the male, but present nearly the same form. The length of the cephalothorax to the base of the rostral spines is about 26 millim., and the distance between the tips of the posterior branchial spines, indicating the greatest width of the carapace, amounts to

22 millim.; the legs of the second pair are about twice as long as the cephalothorax, measuring 58 millim.

Mr. Miers presumes that this species is identical with *Naxioides hirta*, A. Milne-Edw., from Zanzibar; I think he is right.

As *Naxia* (*Naxioides*) *Petersii* has been observed on the coast of Mozambique and at the Amirante Islands, it would appear to occur throughout the whole northern Indian Ocean.

Genus SCHIZOPHRYS, *White*.

7. SCHIZOPHRYS ASPERA, *H. M.-Edw.*

Mithrax asper, *Milne-Edwards, Hist. Nat. des Crustacés*, t. I. p. 320 (1831).

Maja (Dione) affinis, *de Haan, Fauna Japonica*, p. 94, t. XXII. fig. 4.

Schizophrys aspera, *Stimpson, Amer. Journ. of Science and Arts*, January 1860.

Schizophrys aspera, *Alph. Milne-Edwards, Crustacés de la Nouv.-Calédonie, Nouv. Arch. du Muséum Hist. Nat.* t. VIII. 1872, p. 231, pl. x. fig. 1 (with the other synonyms).

Three specimens are in the Collection, viz. one adult female provided with eggs, found at King Island Bay, and a smaller sterile female and a very young male from Elphinstone Island.

The cephalothorax of the adult specimen is 54 millim. long (the rostrum included) and 41 millim. broad (without the lateral spines). It belongs to that common variety in which the rostrum consists of two long and straight spines that are each provided with a short, external, obliquely directed accessory spine at the base. The upper surface of the carapace is granular, nowhere spinose.

Schizophrys aspera has been recorded from Zanzibar (*Milne-Edwards*), Madagascar (*Milne-Edwards*), Mauritius (*White*), the coast of Malabar (*Milne-Edwards*), Borneo (*Dana*), Torres Strait (*Haswell*), New Caledonia (*Milne-Edwards*), Navigator Islands (*Milne-Edwards*), and Japan (*de Haan* and *Stimpson*).

This species may thus be said to occur throughout the whole Indo-Pacific region.

Genus MICIPPA, *Leach*.

8. MICIPPA HAANII, *Stimps.*

Pisa (Micippa) Thalia, *de Haan, Fauna Japonica*, p. 98, pl. XXIII. fig. 3.

Micippa Haanii, *Stimpson, Prodromus descript. Animal. evertebr. quæ in Exped. ad Oceanum Pacif. sept. observ. et descripsit, Proc. Acad. Nat Sci. Philadelphia*, Dec. 1857, p. 217.

One very young male specimen was collected in the Mergui Archipelago.

Family PARTHENOPIDÆ.

Genus LAMBRUS, *Leach.*

9. LAMBRUS LONGIMANUS, *H. M.-Edw.*

Cancer macrochelos, *Seba, Thesaurus*, t. iii. pl. xix. figs. 1, 8, & 9.

Lambrus longimanus, *Milne-Edwards, Hist. Nat. des Crustacés*, t. i. p. 354 and *Cuvier, Règne Animal, Crustacés*, pl. xxvi. fig. 1.

Lambrus longimanus, *Bleeker, Recherches sur les Crustacés de l'Inde Archip., Batavia* 1856, p. 17.

Lambrus longimanus, *Miers, On some Species of Maioid Crustacea, Ann. & Mag. Nat. Hist.* 1879, 5th ser. vol. iv. p. 20.

Four specimens were collected in the Mergui Archipelago, one of which, a very young individual, was found at Owen Island. One young specimen is infested with a Bopyrid.

They completely agree with the above quoted descriptions and figures. Without doubt the species which Milne-Edwards described as *L. longimanus* is identical with that of which Miers has lately given a more extensive description.

This species has been observed at Mauritius, Java (*Miers*), Amboina, Pondicherry, Philippine Islands (*Rumphius, Milne-Edwards*), Sumatra, Banka (*Bleeker*).

Genus HARROVIA, *Ad. & White.*

10. HARROVIA ELEGANS, n. sp. (Pl. I. figs. 5 & 6.)

One single female individual of this new species was collected at Elphinstone Island.

This species is closely allied to the two other species of *Harrovia*, viz. *H. albolineata*, Adams and White, and *H. tuberculata*, Hasw.; but it may be easily distinguished by the form of the antero-lateral teeth of the cephalothorax, by the structure of the legs, and by some other characters.

As regards its outer physiognomy, this species much resembles *H. albolineata*. The upper surface of the cephalothorax is hexagonal, and the distance between the last antero-lateral teeth is scarcely once and a half the length of the carapace. The upper surface is a little convex, smooth, though minutely punctate when seen under a lens, and densely tomentose; the interregional grooves are faintly indicated, though they distinctly separate the somewhat prominent protogastric lobes from one another, from the mesogastric lobe, and from the adjacent hepatic and epibranchial regions. The cervical suture, which separates the gastric from the cardiac region, is also distinct; and an impressed line is found close to and parallel to the posterior margin of the cephalothorax. This posterior margin is slightly emarginate in the middle.

The front has the characteristic form of the other *Harroviæ*, being divided by a small median triangular incision into two truncated lobes, which have minutely granulated anterior margins. As in the other species of this genus, the internal angles of the upper orbital margins constitute a strong conical acute tooth on each side of the front; whereas the front is much deflexed downward, these acute intraorbital teeth are directed straight and horizontally forwards and project slightly beyond the front, as in *H. tuberculata*.

The antero-lateral margins are nearly as long as the postero-lateral; they are divided into four teeth, the first, or anterior, of which is formed by the external orbital angle, which is not at all prominent; this first tooth or lobe is rather broad and truncate, its external margin being straight or scarcely slightly emarginate. The second tooth is also blunt or truncate, but is much narrower than the first, from which it is separated by a rather deep incision. The third tooth is the largest of all, conical and acute; the last tooth resembles the third, but is a little smaller. The postero-lateral margins are slightly convex. The anterior margin of the buccal cavity is slightly emarginate on each side, and the endostome is longitudinally ridged, a clearly-marked ridge occurring on each side. The inflected sides of the cephalothorax are also tomentose. The abdomen (of the female) closely resembles that of *H. albolineata*, being seven-jointed; all the joints are distinctly separated from one another, and the lateral margins of the abdomen are fringed with short hairs.

The slender anterior legs much resemble those of the species which was described by Adams and White. They are unequal in length and in size, the right being somewhat the larger. The right leg measures nearly three times the length of the cephalothorax. Both legs are everywhere granular, except on the inner surface of the palm, which appears almost smooth. The arms are covered with more or less acute granules, a single somewhat larger granule being found at the end of the proximal third of the anterior margin, and another similar granule at the end of the proximal third of the upper margin. The wrist, about twice as long as broad, is everywhere granular, but does not present a tubercle above, as seems to occur in *H. albolineata*. The larger hand resembles that of the last species. The fingers are about half as long as the palm, which presents a longitudinal groove on its granulated outer surface, close to and parallel with the upper margin, and another similar groove below near the under margin; these grooves extend from the articulation with the wrist to the fingers. Two similar grooves are found on the equally convex, though almost smooth, inner surface of the palm. The fingers have acute tips which are perfectly close together; they are longitudinally grooved, and the mobile finger is granular on its upper margin, and the index also at the base of its outer surface. The sharp inner edges are somewhat denticulate. The other chelipede, which is a little smaller, presents the same characters.

The ambulatory legs and joints are very similar to those of *H. albolineata*, as regards their shape and length, but the meropodites are armed on their upper margins with a row of small acute spinules, whereas there is no tooth at the distal end of the upper border.

Dimensions: —

	millim.
Length of the cephalothorax	6⅗
Distance between the last antero-lateral teeth	9¼
Distance between the external orbital angles	5
Length of the larger chelipede	18
Length of the larger hand (the fingers included) ..	8½
Breadth (height) of the palm at the base of the fingers.	2

Harrovia albolineata has been recorded from Borneo, Hongkong, and the Philippine Islands; *H. tuberculata* from Australia (Darnley Island, Torres Strait). All the species of this interesting genus are thus inhabitants of the Indian seas.

Subtribe *Cyclometopa.*

Family CANCRIDÆ.

Genus ATERGATIS, *de Haan.*

11. ATERGATIS INTEGERRIMUS, *Lam.*

Cancer integerrimus, *Lamarck, Histoire des Animaux sans Vertèbres,* t. v. p. 273.

Cancer integerrimus, *Milne-Edwards, Hist. Nat. des Crustacés,* t. i. p. 374, and *Atlas du Règne Animal de Cuvier,* pl. xi. bis, fig. 1.

Atergatis integerrimus, *de Haan, Fauna Jap., Crustacea,* p. 45, pl. xiv. fig. 1.

Atergatis subdivisus, *Adams and White, l. c.* p. 38, pl. viii. fig. 3.

Atergatis integerrimus, *Alph. Milne-Edwards, Etudes Zoölogiques sur les Crustacés récents de la Famille des Cancériens, Nouv. Arch. du Museum Hist. Nat.* t. i. 1865, p. 235.

Three young male specimens are in the Collection, two of which were collected at Owen Island, and the third at King Island.

Dimensions of these specimens :—

	1. millim.	2. millim.	3. millim.
Length of the cephalothorax....	22	18	10½
Breadth of the cephalothorax ..	36	30½	18½

This species has been recorded from Zanzibar, Ceylon, Java, the Philippine Islands, Hongkong, and Japan. Its geographical distribution therefore embraces the whole Indian Ocean and the Chinese and Japanese seas.

12. ATERGATIS FLORIDUS, *Rumph.*

Cancer floridus, *Rumphius, D'Amboinsche Rariteitkamer,* p. 16, pl. viii. fig. 5 (1705).

Cancer Ocyroe, *Herbst, l. c.* pl. liv. fig. 2.

Cancer Ocyroe, *Milne-Edwards, Hist. Nat. des Crustacés,* p. 375.

Atergatis floridus, *de Haan, l. c.* p. 46; *Stimpson, l. c.* p. 30.

Atergatis floridus, *A. Milne-Edwards, Nouv. Arch. du Muséum Hist. Nat.* t. i. p. 243; *Heller, Crustaceen der Novara-Reise,* p. 8.

Eleven specimens of different sizes were collected in the Mergui Archipelago, two at Elphinstone Island, eight at Owen Island, and one at King Island Bay. The largest was collected at Elphinstone Island, and its cephalothorax is 57 millim. broad; the carapace of a female, which is provided with eggs, is 37 millim. broad.

A widely distributed tropical species, recorded from the Red

Sea, Natal, Java, Amboina, New Caledonia, Tahiti, Loo-Choo Islands, and Japan.

Genus Carpilodes, *Dana*.

13. Carpilodes Stimpsoni, *A. Milne-Edw.*

Carpilodes Stimpsoni, *A. Milne-Edwards, Nouv. Arch. du Muséum Hist Nat.* t. i. p. 232, pl. xi. fig. 2 (1865), and *Nouv. Arch. du Muséum Hist. Nat.* t. ix. p. 181.

Two male specimens were collected at Elphinstone Island. They agree very well with the original description, but the upper and external surface of the hands is not a little granular, but only rugose, and the penultimate joint of the abdomen in both individuals is quadrate, as long as broad, and resembles that of *Carpilodes venosus*, Milne-Edw., while in New-Caledonian specimens, according to the figure given by A. Milne-Edwards, this joint is a little broader than long.

The cephalothorax of the larger specimen is 13¼ millim. broad and 8 millim. long.

This species is most closely allied to *Carpilodes venosus*, M.-Edw. (= *Carpilodes obtusus*, de Haan), for the latter appears to be only distinguished by the upper surface of the carapace and of the hands being wholly smooth.

Carpilodes Stimpsoni has hitherto been only recorded from the shores of New Caledonia.

Genus Actæa, *de Haan*.

14. Actæa areolata, *Dana*.

Actæa areolata, *Dana, United States Exploring Expedition, Crustacea,* t. i. p. 162, pl. viii. fig. 1.

Actæa areolata, *Alph. Milne-Edwards, Nouv. Arch. du Muséum Hist. Nat.* t. i. p. 264.

One male specimen was collected at Elphinstone Island.

Though doubtless belonging to this species, it presents nevertheless two slight differences from Dana's figure which are worthy of notice, as being probably caused by the fact that this specimen had not yet attained its full size. The front projects a little more forward, and the most internal lobule of the protogastric lobe (areola 2 M), which is adjacent to the mesogastric lobe, is scarcely broader than the latter, while this lobule in Dana's figure appears nearly twice as large as the mesogastric lobe.

The cephalothorax of this specimen is 18¾ millim. broad and

8¼ millim. long (exclusive of the basal portion of the abdomen). The pterygostomian regions are sulcate in this species.

Actæa areolata has previously been recorded from the Sooloo Sea or Balabac Straits.

15. ACTÆA RUFOPUNCTATA, *M.-Edw.*

Xantho rufopunctatus, *Milne-Edwards, Hist. Nat. des Crustacés*, t. i. p. 389.

Actæa rufopunctata, *Alph. Milne-Edwards, Nouv. Arch. du Muséum Hist. Nat.* t. i. p. 268, pl. xviii. fig. 1.

Actæa pilosa, *Stimpson, l. c.* p. 31, and *A. Milne-Edwards, l. c.* p. 265.

Six fine specimens (three ♂, three ♀) are in the Collection, four of which were collected at King Island Bay, while the two other male specimens were found at Elphinstone Island.

The cephalothorax of an ova-bearing female is 28 millim. broad and 20½ millim. long. These numbers in an adult male are respectively 32 millim. and 23 millim.

. I refer these specimens to the common Indian *Actæa rufopunctata*, as they nearly completely present the striking characters of that species. In all these specimens, however, the whole upper surface of the cephalothorax and the outer surface of the legs, besides being clothed with a short close down, similar to that of *A. tomentosa*, are moreover covered with longer yellowish-brown hairs, which were not described by the French carcinologist; and, secondly, the cardiac region of the upper surface of the cephalothorax never shows even a trace of a median groove, which is visible in Milne-Edwards's figure.

The specimens are of a yellowish colour, and marked with red spots on the carapace and on the legs. The individuals which I described some time ago under the name of *A. rufopunctata* (Notes from the Leyden Museum, vol. ii. p. 172, and vol. iii. p. 96) seem to belong to the same species, but the median frontal lobes are less prominent in the Red-Sea specimens, a difference which may probably be ascribed to their being younger. Nevertheless, the small size of these specimens, already bearing eggs, is very remarkable.

Actæa pilosa, Stimpson, from Hongkong is, in my opinion, identical with *A. rufopunctata*. As regards *Actæa Kraussi*, Heller, from the Red Sea and from the Island of Bourbon, I may observe that it differs from these specimens by its comparatively more enlarged cephalothorax, by the subhepatic regions being sulcated (as in *A. hirsutissima* and *A. areolata*), and by many other details in the structure of the legs.

Actæa rufopunctata has been recorded from Mauritius, Ceylon, Cocos Island, the Fiji and Samoa Islands, the Red Sea, the African coast of the Mediterranean, and even from the Canary Islands. Mr. Miers records its probable occurrence at Madeira and in the South Atlantic.

16. ACTÆA PARVULA, *de Haan*.

Menippe parvulus, *de Haan, Faun. Japon., Crustacea*, p. 21.

Menippe parvulus, *Krauss, Die südafrikanischen Crustaceen*, 1843, p. 34, tab. ii. fig. 2.

Three fine specimens of this apparently very rare species are in the Collection. They were all obtained at Owen Island.

Their measurements are as follows:—

	1. millim.	2. millim.	3. millim.
Length of the cephalothorax . .	16	13	14
Breadth of the cephalothorax .	22½	18	20

They completely agree with the description and with the accurate figure published by Krauss, whose specimens were collected on the coast of Natal, and determined by M. de Haan himself. This species, which belongs to the genus *Actæa*, as characterized by M. Alph. Milne-Edwards, was not taken up by this eminent carcinologist in his Monograph of these Crabs.

Actæa parvula, de Haan, is evidently closely allied to *Actæa setigera*, M.-Edw., from the West Indies, and seems to represent that form in the Indian Ocean. This species may, however, be easily distinguished by a somewhat less enlarged carapace, by the nearly straight postero-lateral margins, and also by some other characters.

As regards the proportion of the length and the breadth of the cephalothorax, this may be expressed by the numbers 47 and 64. The anterior half of the upper surface of the carapace is very convex longitudinally, but the posterior half appears much depressed and flattened, as well longitudinally as transversely. The regions are only distinctly indicated on the two anterior thirds of the upper surface and separated from one another by rather deep interregional grooves, but behind a transverse imaginary line bordering the urogastric lobe the surface appears everywhere depressed, undivided by grooves, and uniformly covered with small, equal, rounded granules. As in *Actæa setigera*, each protogastric region is divided by a longitudinal groove into two subequal lobes. All the lobes of the two anterior thirds of the upper surface are covered with rather coarse, somewhat conical granules, which are even a little larger on the antero-lateral regions than on the gastric lobes. The whole upper surface of the carapace is covered, moreover, by rather long yellowish hairs. The granulated anterior margin of the strongly deflexed, four-lobed front is divided by a deep, narrow, median incision into two halves, each of which is broadly emarginate, so that the frontal margin presents two median, obliquely truncate, large lobes, and two lateral, small, dentiform ones, which are prolonged towards the basal joint of the external antennæ, with which they unite.

As in *A. setigera*, the antero-lateral margins are very indistinctly divided into four lobes (besides the external angle of the orbit): the three anterior lobes are very broad, the last is very small, and all are provided with coarse conical granules equal to those of the adjacent antero-lateral regions. As in *A. hirsutissima* and *A. areolata*, the convex hairy, scarcely granular, subhepatic regions present some narrow grooves, which are prolongations of the fissures that divide the antero-lateral borders. In the male the outer surface of the sternum and of the postabdomen appears rather coarsely punctate, and also somewhat hairy, and the penultimate joint of the latter is a little longer than broad, and a little longer than the terminal segment.

The arms of the equal chelipedes are almost entirely covered by the cephalothorax, and their rounded under surface is somewhat granular. The outer and upper surface of the wrist is covered with numerous conical granules, which resemble those of the antero-lateral regions on the upper surface of the carapace. Also the upper and outer surfaces of the hands present similar conical granules, which are often arranged in longitudinal rows; but their scarcely convex inner surface appears almost smooth, presenting only some few depressed small granules in the middle. The fingers of one of the specimens, which are preserved in alcohol, are of a black colour, those of the two other individuals are brown; in the specimen described by Krauss they presented a somewhat yellowish colour. In this species the colour of the fingers does not extend on the surface of the palm; in *A. setigera* it extends on the palm, according to the description of A. Milne-Edwards. The mobile finger is a little longer than the other; both are pointed, sulcate, and punctate, and they are a little granular and hairy at the base; they are armed along their inner margins with some teeth, which are rather feeble in the female specimen, but strong in the male. The index of the latter is armed with a very strong tooth near the middle, and, moreover, with two or three smaller teeth between the first and the point; the mobile finger presents about six teeth, the two basal ones of which are a little larger than the others. These teeth, like the pointed tips, are of a white colour, and the inner surface of the index is provided with a tuft of short hairs.

Regarding the other legs, I refer to the accurate figure of Krauss; the joints are granular along their upper and under surfaces or margins. The chelipedes, as as well as the ambulatory legs, are provided with tolerably long yellow hairs, which resemble those of the carapace.

As regards *Cancer scaber*, Fabricius (Suppl. Entom. Syst. p. 336), I may observe that it is doubtless a different species, distinguished at first sight from *A. parvula* by its unequal chelipedes, besides some other characters. But *A. parvula* cannot be identified with Milne-Edwards's *Xantho scaber* (*l. c.* p. 390), a species described as being closely allied to *A. setigera*, although it has been referred to Fabricius's species, because it has not been included among the species of *Actæa* described by Prof. A. Milne-Edwards in his Monograph of this genus.

Actæa parvula, de Haan, so far as I know, has hitherto been found only at the Cape and on the rocky coast of Natal.

17. ACTÆA, sp.

The collection contains a small mutilated specimen of a species of *Actæa* which I am unable to determine. This individual is only 7 millim. long and 10½ millim. broad. It is closely allied to *A. parvula*, but the *whole* upper surface of the cephalothorax is lobed, the meropodites of the ambulatory legs are comparatively more enlarged, and the legs are covered with much larger, though also conical, granules.

This specimen, however, which was collected at Elphinstone Island, may prove to be the young of the preceding species.

Genus EUXANTHUS, *Dana.*

18. EUXANTHUS MAMILLATUS, *M.-Edw.*

Cancer mamillatus, *Milne-Edwards, Hist. Nat. Crustacés*, p. 376.

Euxanthus mamillatus, *Alph. Milne-Edwards, Nouv. Arch. du Muséum Hist. Nat.* t. i. p. 292, pl. xv. fig. 2, & t. ix. p. 196.

Four specimens are in the Collection, two of which were collected at Owen Island and two at Elphinstone Island.

I am inclined, with Milne-Edwards, to regard *Euxanthus melissa*, Herbst. *E. nitidus*, Dana, and *E. mamillatus*, M.-Edw., as varieties of the same species. An adult male specimen, the cephalothorax of which is 32 millim. long and 49 millim. broad, wholly agrees with the description of true *E. mamillatus*, M.-Edw., but in younger specimens, about 21–24 millim. in breadth, the elevations of the upper surface of the carapace are somewhat more rugose. I now suspect that in young specimens of these crabs the bosses are always a little rugose, and that they become nearly smooth in adult specimens of *E. mamillatus*, while they remain rugose and become even still more so in the form which has been described as *E Huonii*, Lucas.

Euxanthus mamillatus has hitherto been recorded from the coast of Cochin China and from Australia.

Genus XANTHO, *Leach.*

19. XANTHO IMPRESSUS, *Lam.*

Cancer impressus, *Lamarck, l. c.* p. 272.

Xantho impressus, *Milne-Edwards, Hist. Nat. Crustacés*, t. i. p. 393.

Xantho impressus, *Alph. Milne-Edwards, Crustacés de la Nouv. Calédonie, Nouv. Arch. du Muséum Hist. Nat.* t ix. p. 198, pl. vi. fig. 2.

One young male specimen was collected near Owen Island, the cephalothorax of which is 22 millim. long and 38 millim. broad.

This very rare species has been collected also at Mauritius and on the shores of New Caledonia, so that we may conclude that it is distributed throughout the Indian Ocean and the Malayan archipelago.

Genus MEDÆUS, *Dana*.

20. MEDÆUS DISTINGUENDUS, *de Haan*.

Cancer (Xantho) distinguendus, *de Haan, Fauna Japonica, Crustacea*, p. 48, tab. xiii. fig. 7.

Chlorodius distinguendus, *Stimpson, l. c.* p. 32.

Xantho distinguendus, *Heller, Beitrage zur Crustaceen-Fauna des rothen Meeres, Sitzungsber. k. Acad. Wiss. Wien*, Bd. xliii. 1861, p. 323.

Eleven specimens (6 ♂, 5 ♀) were collected, eight at Elphinstone Island and three at King Island Bay.

These specimens, which are doubtless very young, agree so well with the description and the figure of *Xantho distinguendus* in the 'Fauna Japonica,' that I have no hesitation in regarding them as identical with it. They seem only to differ a little from the Japanese specimens in the meropodites of the ambulatory legs being less distinctly granulated, and in the upper margin of these joints being slightly carinate.

I have little else to add to the existing description, this species having been well figured by de Haan. The postero-lateral sides of the carapace are distinctly granulate, the cardiac region appears smooth to the naked eye, but minutely granulate and punctate when it is seen under a magnifying-glass. The penultimate joint of the male abdomen is nearly quadrate, with the lateral margins slightly concave.

Stimpson was in error in referring this species to the genus *Chlorodius*, and in supposing it to be probably a variety of *Leptodius exaratus*, the fingers of the anterior legs being pointed and not at all excavated. *Leptodius exaratus*, moreover, is a quite different species.

I refer de Haan's *Xantho distinguendus* to the genus *Medæus*, because it agrees perfectly in its physiognomy and outer appearance with the other representatives of the genus, as, *e. g.*, *Medæus elegans*, Alph. M.-Edw. One of the specimens is infested by a Bopyrid.

Dimensions of the largest specimen (♂):—

	millim.
Distance between the last antero-lateral teeth ..	19½
Length of the cephalothorax, the basal portion of the abdomen not being included	13

Medæus distinguendus, de Haan, has previously been recorded from Japan and Hongkong, and it seems to occur also in the Red Sea according to Dr. Heller.

Genus Chlorodius, *Rüpp.*

21. Chlorodius niger, *Forskål.*

Cancer niger, *Forskål, Descriptiones animalium &c.* (Hafniæ, 1775), p. 89.

Chlorodius niger, *Rüppell, Beschreibungen und Abbildungen von 24 Arten kurzschwänzigen Krabben* (Frankfurt, 1830), p. 20, Taf. iv. fig. 7.

Chlorodius niger, *Milne-Edwards, Hist. Nat. Crust.* i. p. 401; *Alph. Milne-Edwards, l. c.* p. 214.

Chlorodius niger, *Stimpson, l. c.* p. 31; *Heller, l. c.* p. 18.

Cancer (Xantho) denticulatus, *de Haan, Herklots, Symbolæ carcinologicæ* (Leyden, 1861), p. 10.

Chlorodius niger, *de Man, Notes from the Leyden Museum*, vol. ii. p. 174.

Six specimens of different sizes were collected at Elphinstone Island, an adult female and five younger specimens.

The cephalothorax of the adult individual is 23 millim. broad and 15 millim. long. The specimens all belong to that variety in which the two posterior antero-lateral teeth are acute, spiniform, and obliquely directed forward; the two anterior antero-lateral lobes and the external orbital angles are rounded. The anterior margin of the arms of the chelipedes is armed with a small acute tooth, and the upper margin is somewhat granular.

This species seems to be distributed throughout the whole Indo-Pacific region, having been recorded from the Red Sea (Tor, Djeddah), the Seychelles, Zanzibar, Madagascar, Mauritius, Madras, Nicobar Islands, the Malayan archipelago (Java, Timor, Halmahera), the coasts of Australia (Port Jackson, Darnley Island), New Guinea, New Caledonia, and the Pacific Ocean (Fiji, Loo-Choo, and Samoa Islands) as far as Tahiti.

22. Chlorodius sculptus, *Alph. M.-Edw.*

Chlorodius sculptus, *Alph. Milne-Edwards, Nouv. Arch. du Muséum Hist. Nat.* t. ix. p. 217, pl. viii. fig. 4; *de Man, Notes from the Leyden Museum*, vol. iii. p. 98.

Three fine specimens (2 ♂, 1 ♀) were collected at Sullivan Island.

The cephalothorax of the largest individual is 15½ millim. long and 25 millim. broad. As in *Chlorodius niger*, so also in this species, the form of the antero-lateral teeth is variable

In two specimens only the last antero-lateral tooth on each side is spiniform; and this probably has also been the case in the third example, but unfortunately in it these teeth seem to be broken off. In the specimens from New Caledonia, described by M. Alph. Milne-Edwards, the last two antero-lateral teeth were spiniform. Not only is the anterior margin of the arms of the chelipedes armed with more or less acute tubercles, but some are also present on the upper margin. The ambulatory legs are densely covered, along their upper margins, with long yellowish hairs and, as in the Red-Sea specimen described by me some time ago, the upper margin of the meropodites is spinulose and not granulose, as stated by Alph. Milne-Edwards.

Chlorodius sculptus, a very distinct species, has previously been found in the Red Sea (*de Man*), on the shores of the Seychelles, the Samoa Islands, and New Caledonia.

Genus LEPTODIUS, *A. M.-Edw.*

23. LEPTODIUS EXARATUS, *M.-Edw.*

Chlorodius exaratus, *Milne-Edwards, Hist. Nat. Crustacés*, t. i. p. 240; *Stimpson, l. c.* p. 31.

Cancer (Xantho) affinis, *de Haan, Fauna Japonica*, p. 48, pl. xiii. fig. 8.

Leptodius exaratus, *Alph. Milne-Edwards, l. c.* p. 222.

Leptodius exaratus, *Kossmann, Zoolog. Ergebnisse einer Reise in die Küstengebiete des rothen Meeres*, 1877, p. 32, Taf. ii.

Twenty-five rather young specimens of this widely distributed species are in the Collection; all belong to the typical *L. exaratus*, M.-Edw. Thirteen were collected at Elphinstone Island Bay (7 ♂, 6 ♀), six at Owen Island (3 ♂, 3 ♀), and six at King Island Bay. One of the Elphinstone-Island female specimens is infested with a *Sacculina*.

24. LEPTODIUS NUDIPES, *Dana.*

Chlorodius nudipes, *Dana, United States Explor. Exped., Crust.* t. i. p. 209, pl. xi. fig. 12.

Leptodius nudipes, *Alph. Milne-Edwards, Nouv. Arch. du Muséum Hist. Nat.* t. ix. p. 225.

Two specimens (♂ ♀) were collected at Owen Island. The cephalothorax of the larger specimen, the male, is 16½ millim. broad; whereas the female individual, which is already carrying eggs, is scarcely 10 millim. broad. According to Milne-Edwards, this species, however, attains a breadth of 20 millim.

I have only to add to the quoted descriptions that the posterior half of the upper surface of the cephalothorax is also punctate, so that the whole upper surface is punctate. This species presents a singular resemblance to *Xantho nudipes*, Alph. M.-Edw. (*l. c.* p. 197, pl. vii. fig. 5). In this latter form, however, which has the fingers of the chelipedes pointed and not at all excavated, the distance of the orbits measures only *a third* of the breadth of the carapace, whereas in *Leptodius nudipes* the cephalothorax is *scarcely twice* as broad as the distance of the orbits.

Leptodius nudipes, Dana, has been recorded from the Strait of Balabac, New Caledonia, New Zealand, and the Sandwich Islands.

25. LEPTODIUS CAVIPES, *Dana*.

Chlorodius cavipes, *Dana, l. c.* t. i. p. 212, pl. xii. fig. 1; *Stimpson, l. c.* p. 32.

Three specimens (1 ♂, 2 ♀) of this rare species were collected at Owen Island. They agree perfectly with the original description and with the figure quoted.

The cephalothorax of the largest specimen (♂) is 12 millim. broad, and the smaller female, which is already provided with eggs, is only 10 millim. broad. According to Dana, however, this species attains a breadth of more than 10 lines.

The rare *Leptodius cavipes* has hitherto been recorded, so far as I know, only by Dana and by Stimpson from the Bonin Islands.

26. LEPTODIUS, sp.

The Collection contains two very young specimens, namely, a male individual found at Elphinstone Island, and a female from Owen Island, which are closely allied to *Leptodius exaratus*, but which differ from that common species by the hands being covered *with small granules*. The cephalothorax of the male specimen is scarcely 9 millim. broad, that of the other scarcely 10 millim. As regards the shape of the carapace, these examples resemble very well *Leptodius exaratus*, the antero-lateral margins being armed with four teeth, but the upper surface is somewhat minutely granular anteriorly. The chelipedes of the male are unequal, those of the female almost equal; the granules, with which the outer surface of the hands is provided, are more distinct in the male than in the female. I do not venture to give a new name to these specimens, especially as this granulation may hereafter prove to be a character of very young individuals, similar to what occurs in young specimens of *Eriphia lævimana.* Perhaps these specimens belong to Haswell's *Leptodius granulosus* (Proc. Linn. Soc. N. S. W. vol. vi.), but his description is not at my disposal.

Genus CHLORODOPSIS, *A. M.-Edw.*

27. CHLORODOPSIS PILUMNOIDES, *Ad. & White.*

Chlorodius pilumnoides, *Adams and White, Zoology of the Voyage of H.M.S. 'Samarang,'* 1850, *Crustacea,* p. 41, tab. ix. fig. 3.

Seven specimens were collected at Owen Island, viz. two very young males and five females; two of the latter are adults. They fully agree with the original description and figure. In the adult females the anterior margin of the arms of the chelipedes is armed with a row of four or five strong spines. The species may easily be distinguished by this character from the closely allied *Chlorodopsis melanochira,* A. M.-Edw., from New Caledonia. In the females the black coloration of the fingers does not extend on the outer or inner surface of the palm, whereas in the adult male it does do so according to Mr. Miers. In the young specimens the anterior margin of the arm is still nearly unarmed, only presenting one or two small acute tubercles at the proximal end; the anterior margin of the front and the orbits are also less spinulose in these young individuals.

Chlorodopsis pilumnoides has hitherto only been recorded from Singapore and the Philippine Islands.

Genus CYMO, *de Haan.*

28. CYMO ANDREOSSYI, *Aud.*

Pilumnus Andreossyi, *Savigny, Description de l'Egypte, Crust.* p. 86, pl. v. fig. 5.

Cymo Andreossyi, *Heller, Sitzungsber. k. Akad. Wiss. Wien,* 1861, p. 346.

Cymo Andreossyi, *Heller, Crustaceen der Novara-Reise,* 1865, p. 20.

Cymo melanodactylus, *de Haan, Fauna Japonica, Crust.* p. 22.

Cymo Andreossyi, *Miers, Report Zool. Collections of the Voyage of H.M.S. 'Alert,'* 1884, p. 532.

A male specimen is in the collection from Sullivan Island, and it perfectly agrees with a specimen collected at Djeddah, in the Red Sea. It is only 10 millim. broad, whereas the breadth of the Djeddah specimen is 18½ millim. The individual from Sullivan Island belongs to the variety *melanodactyla*, the fingers being dark-coloured with white tips. The right leg is largest. The frontal margin is armed between the dentiform internal orbital angles, on each side of the median furrow, with five small acute teeth: the first, third, and fifth are of equal size, the second and fourth a little smaller; the first or median teeth are a little more prominent than the others.

Cymo Andreossyi, with the variety *melanodactyla*, is distributed throughout the Red Sea, the Indian Ocean, the Malayan archipelago, as far as the Fiji and Samoa Islands.

Genus MENIPPE, *de Haan.*

29. MENIPPE RUMPHII, *Fabr.*

(Compared with a typical specimen of Fabricius's *Cancer Rumphii.*)

Cancer Rumphii, *Fabricius, Supplementum Entom. Syst.* p. 336.

Cancer Rumphii, *Herbst, Krabben und Krebse*, iii. p. 63, Taf. xlix. fig. 2.

Pseudocarcinus Belangeri, *Milne-Edwards, Hist. Nat. des Crustacés*, t. i. p. 409, pl. xiv. bis, fig. 25.

Menippe Belangeri, *Heller, Crustaceen der Novara-Reise*, p. 15.

Nec Pseudocarcinus Rumphii, *Milne-Edwards, l. c.* p. 408.

Three rather young specimens were collected at King Island. I am indebted to Dr. F. Meinert of Copenhagen for an excellent photograph of the typical specimen of Fabricius's *Cancer Rumphii*, collected by Daldorff on the coast of Tranquebar. After having compared these specimens with that figure, I was led to the conclusion that they belong to *Menippe Rumphii*, Fabr. I then sent one of them to Dr. Hilgendorf, who informed me that it was also identical with Herbst's *Cancer Rumphii*. As had already been proved in 1872 by Prof. von Martens, I am also inclined to regard Milne-Edwards's *Pseudocarcinus Belangeri* as identical with the true *Menippe Rumphii*, Fabr., whereas *Pseudocarcinus Rumphii*, M.-Edw., is doubtless a different species.

I have before me an adult male specimen of *Menippe Rumphii*, Fabr., collected on the coast of Atjeh, and I may now add the following particulars to the existing descriptions of this species.

Menippe Rumphii, Fabr., really belongs to the genus *Menippe*, because the peduncle of the external antennæ occupies the internal hiatus of the orbits, the inferior margin of which is not united with the upper margin; the basal joint is rather small, the second scarcely reaches the front, and the third joint occupies the orbital hiatus, though not filling it. As in *Myomenippe*, the flagellum of these antennæ is rather short, being only as long as the breadth of the front.

The cephalothorax is rather enlarged, the proportion of its length to its breadth (the distance of the penultimate antero-lateral teeth) being, as Heller rightly observes, as 43 to 63. The upper surface is slightly convex longitudinally, being rather declivous towards the front and towards the antero-lateral margins; the posterior half is rather flattened and much depressed. The interregional grooves are very shallow, and some of them are scarcely or not at all indicated; besides the usual median frontal furrow, shallow gastro-branchial and branchio-cardiac grooves are present, the latter being, however, very faintly marked in young individuals. The transverse groove (cervical suture), which in other species separates the gastric region from the cardiac, is wanting. On each side of the gastric region, a faintly marked, arcuate sutural line is found, the inner end of which terminates in the middle of the gastro-branchial groove; whereas the postero-external end issues into a short impressed line, which proceeds obliquely inward and backward from the last antero-lateral tooth. The same grooves are found also in *Myomenippe granulosa*, A. M.-Edw., in which they are very deep; they are, on the contrary, very shallow and often scarcely distinct in *Menippe Rumphii*, Fabr. In *Myom. granulosa* the regions are very prominent and covered with granules, while in *Men. Rumphii* they are only partly indicated and smooth. Though the upper surface is smooth and glabrous, it is, however, punctate, especially on the antero-lateral portions and on the gastric region; the punctations are generally minute, but some larger ones are scattered over the hepatic region, on the protogastric lobes, and on the arcuate sutural line, which occurs on each side of the gastric region.

The slightly prominent front is rather narrow, the distance of the internal angles of the upper orbital margins measuring scarcely more than one fifth of the greatest width of the cephalothorax. The front presents four obtuse rounded lobes; the internal lobes are broad and rounded, and nearly twice as broad as the external, which are much smaller, much less prominent, dentiform and obtuse. The internal lobes are separated from one another by a rather deep triangular incision, the internal from the external by a shallower emargination. The smaller, external, frontal lobes finally are separated from the obtuse, little prominent, internal angles of the upper orbital margins by an equally shallow emargination. Whereas in *Myom. granulosa*, A. M.-Edw., the front is armed with six lobes, the four lateral ones of which are dentiform, the front of *Men. Rumphii* only presents four lobes, of which the internal are nearly twice as broad as the external, as I have already observed. Immediately behind the median or internal frontal lobes, two rounded tubercles or prominences are seen on the front, between the internal orbital angles, one behind each median frontal lobe; a little more backwards the two rounded epigastric lobes are found, which are ovate, rounded, and as prominent as the two lobes that lie before them on the front. Immediately behind the epigastric lobes, the four protogastric lobes are observed, which are, however, very faintly marked, the grooves which separate the internal from the external being scarcely indicated. All these lobes are separated from one another by the median frontal furrow, which is distinctly marked. The orbits are small and round, and their upper margin presents traces of two fissures. The external angle of the orbits is very small, obtuse, and scarcely prominent; as in *Myom. granulosa*, A. M.-Edw., it is separated by a small hiatus from a somewhat larger, obtuse tubercle, which lies immediately below it, on the inferior orbital margin, which is somewhat more prominent. The internal lobe of the inferior orbital margin is rounded and obtuse, and projects comparatively less forward than in *Myom. granulosa*, being less prominent than the external frontal teeth.

The antero-lateral margins, which are almost as long as the postero-lateral, present four lobes behind the external angles of the orbits, the two posterior of which are dentiform and slightly prominent; the two anterior, however, are broad, scarcely prominent, and obscure. They are separated from one another by rather small, shallow notches; quite different from the prominent antero-lateral lobes of *Myom. granulosa*, which are separated from one another by deep incisions. The greatest width of the cephalothorax is at the penultimate antero-lateral teeth. The postero-lateral margins are oblique and straight.

The endostome is not ridged longitudinally. The pterygostomian regions and the inflected sides of the carapace are smooth; the latter are hairy on the posterior half, above the bases of the legs. As regards the shape and structure of the outer foot-jaws, this species fully agrees with *Myom. granulosa.*

The anterior legs greatly resemble those of *Myom. granulosa,* but they are everywhere completely smooth, though sparsely punctate. They are as unequal as in that species, the right leg in all the specimens being largest. The upper margin of the arm, which is fringed with short hairs, does *not* present a small acute spine at its distal end. The internal angle of the wrist is slightly prominent, rounded and obtuse. The larger hand is but little shorter than the greatest width of the cephalothorax and about twice as long as high. In the shape of the palm and of the fingers, and in the armature of the latter, this species closely resembles *Myom. granulosa.* The ambulatory legs of both species are very similar to one another, the three terminal joints being rather hairy.

Dimensions of a large male specimen:—

	millim.
Length of the cephalothorax	40
Greatest width of the cephalothorax	58
Distance of the internal angles of the upper orbital margins	12¾
Length of the larger hand	54
Height of the larger hand....................	25

Menippe Rumphii, Fabr., inhabits the Bay of Bengal and the neighbouring seas, being recorded by Fabricius from the coast of Tranquebar, and by Heller (as *Menippe Belangeri*) from the Nicobar Islands, whereas the above described specimen was collected by Mr. J. A. Kruyt on the coast of Atjeh (Sumatra).

Genus MYOMENIPPE, *Hilgendorf.*

The genera *Menippe* and *Myomenippe* stand greatly in need of revision, much confusion being still found in the synonymy of their species. The genus *Myomenippe* chiefly differs from *Menippe* by the external antennæ being quite excluded from the orbits, the inferior margin of which is united with the upper margin, as in the genus *Euruppellia,* Miers.

80. MYOMENIPPE GRANULOSA, *A. M.-Edw.* (Pl. II. fig. 1.)

Menippe granulosa, *Alph. Milne-Edwards, Descriptions de quelques espèces nouvelles de Crustacés Brachyures, Ann. Soc. Entomol. de France*, vii. 1867, p. 275.

Myomenippe duplicidens, *Hilgendorf, Monatsb. k. Akad. Wiss. Berlin*, Nov. 1878, p. 796 (footnote).

Four fine specimens were collected in the Mergui Archipelago, viz. an adult male and three younger males.

One of the latter was sent by me successively to Dr. Hilgendorf, of Berlin University, and to Prof. A. Milne-Edwards, in order to attain accuracy in naming these specimens. Dr. Hilgendorf informed me that it belonged to his *Myomenippe duplicidens*, whereas Prof. Milne-Edwards stated that it was a representative of his *Menippe granulosa* The latter name has the priority, as it was established eleven years before the former. Dr. Hilgendorf moreover mentioned to me the characters by which this species may be distinguished from *Menippe Panope*, Herbst, which is a true *Menippe*, and from *Menippe Rumphii*, Fabr., which is identical with *Menippe Belangeri*, M.-Edw.

As *Myomenippe granulosa*, A. M.-Edw. (=*duplicidens*, Hilg.), is still insufficiently known, I will describe the largest specimen.

The upper surface of the cephalothorax is rather convex, and the regions are very distinctly indicated, being separated from one another by rather deep interregional grooves. The elevated parts of the upper surface are covered with numerous very distinct granules, and the postero-lateral regions of the cephalothorax are also granular. The front is divided into six teeth, of which the two, most prominent, median or first teeth are much broader than the two lateral of each side; the median teeth are truncate anteriorly, whereas the two lateral teeth are tuberculiform, the third tooth being even a little smaller than the second. Immediately behind the second teeth, and on each side, a granulated, small, rounded tubercle is found. The front is separated from the orbits by a fissure, which is broader and deeper than the fissure between the second and third frontal teeth; behind the former fissure the terminal joint of the peduncle of the external antennæ is visible—that is, perfectly excluded from the orbits. The internal angle of the granulated upper margin of the orbits is rather obtuse, extends less forward than the frontal teeth and

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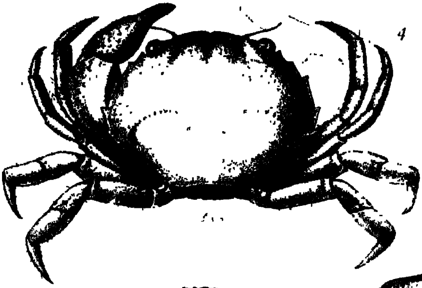

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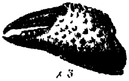

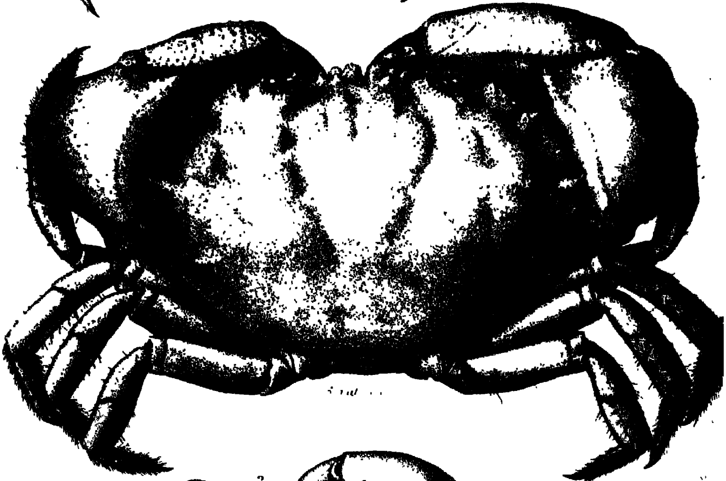

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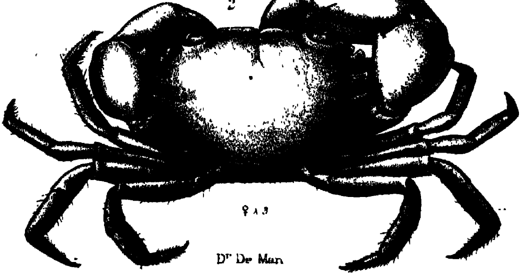

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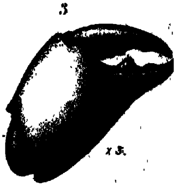

Dr De Man

1 MYOMENIPPE GRANULOSA. 2, 3. ACTUMNUS NUDUS.
4, 5. EURYCARCINUS MACULATUS.

Berjeau & Highley lith.

Mintern imp.

than the large rounded internal lobe of the infraorbital margin, which even extends a little more forward than the third frontal teeth, though less than the second. The external angle of the upper orbital margin is small and less prominent than the external angle of the under margin, from which it is separated by a small hiatus. The internal infraorbital lobe is united in this species with the obtuse internal angle of the upper margin, so that the orbits are perfectly closed internally, a character which even distinguishes the genus *Myomenippe*. This character is already present in the youngest specimen, which is only 22 millim. broad. According to Hilgendorf, the orbits of young specimens of *Myomenippe Fornasinii*, 12 millim. broad, are also already closed internally, precisely as in the adult. The lateral margins of the cephalothorax are armed with four teeth, besides the small external orbital angle; these teeth are separated from one another by rather deep incisions, and their margins are minutely granulated. The first is triangular and acute, and its external margin is slightly emarginate. The second, the largest of all, is almost twice as long as the first, and its external margin is nearly straight. The third and fourth teeth are more acute than the two preceding; the third tooth is shorter than the second, but a little longer than the first, and it is directed straightly forwards, the external margins of both third teeth scarcely converging backwards. The fourth or last antero-lateral tooth is directed obliquely outwards and forwards.

The chelipedes of the male are a little unequal, the right being the larger in all these specimens. The arms project scarcely beyond the lateral margins of the cephalothorax. The upper margin of the arms terminates quite at the distal end in a small acute spine, which may easily be overlooked. The wrist presents an acute, prominent, dentiform, internal angle slightly curved upwards; the upper surface of the wrist is granular anteriorly outwards and along the inner margin, the granules being less distinct on the middle of the upper surface; in the younger specimens the whole upper surface is more or less granular. In the adult male the length of the larger hand measures nearly three fourths of the breadth of the cephalothorax; the hand is quite smooth on its outer and inner surfaces, and also on its under margin, but it is granular on and near the rounded upper margin, and some granules are also observed on the outer surface close to the articulation with the wrist. The mobile finger is granular at the base of its upper margin; its inner margin is armed with five or six teeth, the two basal being a little larger than the others. The immobile finger is armed with a large tooth, that occupies the basal half of the inner margin, and with two much smaller teeth. In the smaller (left) hand the outer surface of the palm is a little more granulated than that of the right, the outer surface being also granular towards the base of the immobile finger and even a little towards the under margin; the mobile finger is armed much in the same manner as in the other hand, but the immobile finger presents six teeth, of which the fourth is much larger than the others, though not so large as the large tooth of the index of the right hand; the first, second, and sixth teeth are very small.

In the younger individuals the hands are more granulate than in the adult. In a broad specimen, 39 millim., the whole outer surface of the smaller hand is still granular, and the outer surface of the larger hand is also nearly wholly granular. In the smallest specimen, which is only 22 millim. broad, the hands are everywhere granular on their whole outer surface.

As regards the ambulatory legs, which are hairy, especially on the last two joints, I will only remark that the first two pairs have nearly the same length, that the third pair is somewhat shorter, and that the legs of the last pair are the shortest of all.

Dimensions of the adult specimen and of a younger one:—

	millim.	millim.
Length of the cephalothorax	50	28
Breadth of the cephalothorax (distance between the third or penultimate lateral teeth)	71	39
Distance between the external orbital angles	33	20½
Length of the larger hand	54	28

Myomenippe granulosa, A. M.-Edw., has hitherto been recorded from the coast of Batavia (*Milne-Edwards*) and from the seas of Celebes (*Hilgendorf*); this species therefore inhabits the Malayan archipelago and the neighbouring seas.

As regards *Menippe granulosa*, Strahl (Archiv f. Naturg. xxvii. p. 105, 1861), Prof. v. Martens has shown that this species is identical with *Menippe Panope*, Herbst, after an examination of both the typical specimens.

I am indebted to Dr. Hilgendorf for the following information regarding *Cancer Panope*, Herbst, which really belongs to the genus *Menippe*, the orbits not being closed internally. The typical specimen of Herbst's *Cancer Panope* is 19½ millim. broad and 14⅔ millim. long. In this species the granules, which are found on the middle of the outer surface of the hands, are larger than those of the upper and under margins of the palm, as they have a diameter of ½ millim., whereas in *Myomenippe granulosa*, A. M.-Edw., the largest granules are found on the upper margin. In *Menippe Panope* the front is *not* divided into six teeth, and the postero-lateral regions of the cephalothorax are nearly quite smooth behind the last antero-lateral tooth, whereas they are distinctly granular in *Myomenippe granulosa*, A. M.-Edw. The lobes on the upper surface of the carapace are less distinct in *Menippe Panope*, being even less developed than in Herbst's figure. The course or direction of the last antero-lateral tooth and the form of the posterior margin of the cephalothorax are also somewhat different in both species.

Genus EURYCARCINUS, *Alph. M.-Edw.*

There can be little doubt that the small crustacean described by Alph. Milne-Edwards as a second representative of his genus *Pilumnopeus* must be referred to *Eurycarcinus*. *Pilumnopeus maculatus*, indeed, perfectly agrees, in its outer appearance and in its essential characters, with the true representatives of *Eurycarcinus*, viz. *E. natalensis*, Krauss, *E. Grandidieri*, A. M.-Edw., *E. orientalis*, A. M.-Edw., and *E. integrifrons*, d. M.*, so that there is no reason to refer it to a distinct genus.

The small group of Crustaceans which bears the name of *Eurycarcinus* is, in my opinion, a very natural one. It belongs to those forms the palate of which is more or less distinctly divided by a ridge defining the margin of the efferent canal, such as *Ozius*, *Epixanthus*, *Heteropanope*, and *Pilumnus*; but it is distinguished by its outer physiognomy—the enlarged cephalothorax, which is very convex longitudinally, the transverse orbits, the little prominent antero-lateral teeth, the seven-jointed abdomen of the male, &c.

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* I will here remark that *Eurycarcinus integrifrons*, which I described some years ago (Notes from the Leyden Museum, i. p. 55), may perhaps prove to be identical with *Eurycarcinus orientalis*, very shortly described by A. Milne-Edwards from specimens obtained at Bombay (Annal. Soc. Entom. France, 1867, p. 277).

31. **Eurycarcinus maculatus**, *A. M.-Edw.* (Pl. II. figs. 4 & 5.)

Pilumnopeus maculatus, *A. Milne-Edwards, Descriptions de quelques espèces nouv. de Crustacés Brachyures, Annal. Soc. Entom. France*, vii. 1867, p. 277; and *Crustacés de Zanzibar et de Madagascar, Nouv. Arch. du Muséum Hist. Nat.* t. iv. p. 82, pl. xix. figs. 17–19.

A single male specimen was collected at Elphinstone Island.

The cephalothorax of this little species is 8 millim. long and 12⅓ millim. broad, very convex longitudinally and transversely; the upper surface is glabrous, smooth, though minutely punctate on the cardiac region and the surrounding parts of the middle of the carapace, and minutely granular on the frontal and antero-lateral regions. These minute points and granules, however, are only visible with a magnifying-glass, so that the upper surface appears smooth and shining to the unaided eye. Some inter-regional grooves are very faintly indicated, while the others are entirely absent: thus a faint longitudinal median groove is observed on the anterior part of the carapace which separates the two scarcely distinct epigastric lobes; the transverse groove between the gastric and cardiac regions is also feeble, whilst a curved minutely granular line occurs on each side of the carapace, proceeding from the last antero-lateral tooth obliquely forward, as indicated in the figure in the 'Archives.'

The front is not at all prominent but a little deflexed, and its straight anterior margin presents only a small narrow median incision and a very small, scarcely distinct sinus on each side near the lateral angles (internal orbital angles). The upper margin of the orbits is unarmed and presents no fissures; but the under margin presents a triangular hiatus near the external orbital angle, and is armed in the middle with a series of four or five small conical granules, between which some smaller ones occur; the under orbital margin also appears to be a little hairy The antero-lateral margins of the carapace are much shorter than the straight postero-lateral ones; they are armed with four teeth, including the external orbital angles. The first tooth, the outer angle of the orbits, is broadly truncate; the second is a little narrower, but likewise rather obtuse; while the third and the fourth teeth are acute and directed obliquely forward. (In

Eurycarcinus natalensis, Krauss, and *E. Grandidieri*, A. M.-Edw., the second lateral tooth is the largest of all, and in *E. integrifrons*, d. M., the two anterior antero-lateral teeth are of equal size.) The subhepatic region is minutely granular and hairy. The endostome is faintly ridged on each side. The sternum of the male is minutely punctate when seen under a magnifying-glass, and the postabdomen is seven-jointed.

The chelipedes are very unequal in size, and in this specimen the right is the largest. As in the case of the ambulatory legs, they seem to agree in all respects with those of the Zanzibar specimens described by Milne-Edwards. The ambulatory legs are provided along their upper and under margins with some hairs, few in number on the meropodites, but more numerous and dense on the two terminal joints, which moreover bear a close down; and finally the carpopodites of the chelipedes are armed with a small rather acute tubercle at their internal angle. As in specimens from Zanzibar, the outer surface of the hands is marked with numerous small red spots.

This very raro species has hitherto been known only from the shores of Zanzibar.

Genus OZIUS, *H. M.-Edw.*

32. OZIUS TUBERCULOSUS, *H. M.-Edw.*

Ozius tuberculosus, *Milne-Edwards, Hist. Nat. Crustacés*, t. i. p. 405.

Ozius tuberculosus, *Alph. Milne-Edwards, Nouv. Arch. du Muséum Hist. Nat.* t. ix. p. 238, pl. xi. fig. 2; *Heller, Crustaceen der Novara-Reise*, p. 23.

One fine female specimen was collected at Sullivan Island. It has the cephalothorax 57 millim. broad and 41 millim. long.

Ozius tuberculosus had been previously recorded from the Mauritius, the Nicobar Islands, and New Caledonia.

Genus EPIXANTHUS, *Heller.*

Although scarcely generically distinct from *Ozius*, the genus *Epixanthus* may be retained for those species the cephalothorax of which is more enlarged, more depressed and flattened, and in which the fingers of the smaller chelipede are very slender and in contact with one another over their whole length. The genus is represented in the Indo-Pacific region as well as on the shores of West Africa. The former region is inhabited by *Epixanthus frontalis*, M.-Edw., *E. dentatus*, White, and *E. cor-*

rosus, A. M.-Edw.; and the latter by *Epixanthus Hellerii*, a species described also by Prof. A. Milne-Edwards. I may point out that in *E. dentatus* the inferior margin of the orbits presents a distinct hiatus near the external orbital angle, whereas in *E. frontalis* scarcely a trace of it is found.

33. EPIXANTHUS FRONTALIS, *H. M.-Edw.*

Ozius frontalis, *Milne-Edwards, Hist. Nat. des Crustacés*, t. i. p. 406.

Epixanthus frontalis, *Heller, Crustaceen der Novara-Reise*, p. 20; *Alph. Milne-Edwards, l. c.* p. 241.

Nine specimens are in the collection, five (1 ♂, 4 ♀) from King Island, three from Sullivan Island, and one from Elphinstone Bay. In all the right hand is the largest.

Epixanthus frontalis has been observed in the Red Sea (*Kossmann*), in the Persian Gulf, Karak Island (*Heller*), at Zanzibar (*Hilgendorf*), the coast of Tranquebar (*Milne-Edwards*), the Nicobar Islands (*Heller*), the China seas, Japan (*Stimpson*), and New Caledonia (*A. Milne-Edwards*); it would therefore appear to be distributed throughout the whole Indo-Pacific Ocean.

34. EPIXANTHUS DENTATUS, *White.*

Panopæus dentatus, *White, Proc. Zool. Soc.* 1847, p. 226; *Adams and White, Zoology H.M.S. 'Samarang,' Crustacea*, p. 41, pl. XI. fig. 1.

Epixanthus dilatatus, *de Man, Notes from the Leyden Museum*, vol. i. p. 58.

Panopæus acutidens, *Haswell, A Catalogue of the Australian Stalk- and Sessile-eyed Crustacea*, p. 51, pl. i. fig. 2.

Epixanthus dentatus, *Miers, On Malaysian Crustacea, Ann. and Mag. Nat. Hist.* 1880, 5th ser. vol. v. p. 233.

Four specimens were collected at Elphinstone Island. There can be little doubt that Haswell's *P. acutidens* is identical with the species described by White.

Epixanthus dentatus has been collected on the coast of Java, at the Philippine Islands, and on the coast of Australia (Port Darwin).

Genus ACTUMNUS, *Dana.*

This genus is described as having the fingers of the chelipedes spoon-shaped. In the species represented in this Collection the fingers have pointed tips—a fact already pointed out by Prof. A. Milne-Edwards in the case of one of them (Nouv. Arch. t. ix. p. 194).

35. ACTUMNUS SETIFER, *de Haan*.

Cancer (Pilumnus) setifer, *de Haan, Fauna Japonica, Crustacea*, p. 50, pl. iii. fig. 3.

Actumnus tomentosus, *Dana, l. c.* t. i. p. 243, pl. xiv. fig. 2.

Actumnus setifer, *Alph. Milne-Edwards, Nouv. Arch. du Muséum Hist. Nat.* t. i. p. 287, pl. xviii. fig. 5.

Actumnus tomentosus, *Alph. Milne-Edwards, l. c.* p. 285, and *Nouv. Arch. Mus. Hist. Nat.* t. ix. p. 194.

Actumnus setifer, *Miers, Report on the Zoological Collections made during the Voyage of H.M.S. 'Alert,' Crustacea*, pp. 225 & 226.

A small male specimen, which I refer to this species, was collected in the Mergui Archipelago.

The antero-lateral margins are armed with three small spiniform teeth behind the scarcely prominent, though acute external orbital angle, and some small acute granules occur between these spiniform teeth. The lobes of the upper surface of the cephalothorax are very distinct and covered with small acute granules anteriorly and on the antero-lateral regions, those of the hepatic region being the largest and most prominent. The specimen has lost one chelipede. In the preserved chelipede, the outer and upper surface of the hand is covered with many acute granules, which even occur at the base of the index; the mobile finger is covered with some acute granules at its base. The fingers appear to be smooth and their tips are pointed; the index is provided with a small tuft of hair on its outer and on its inner surfaces, near the dentiferous margin. The outer surface of the hand is rather convex, whilst the inner surface is nearly plain and almost perfectly smooth, which is also characteristic of the inner surface of the fingers.

Actumnus setifer has been recorded from Japan, Tahiti, and New Caledonia.

36. ACTUMNUS ELEGANS, n. sp.

Of this new species, seven specimens (5 ♂, 2 ♀) were collected at Sullivan Island. It is most closely allied to *Actumnus obesus*, Dana, from the Sandwich Islands, which evidently represents this form in the Mergui Archipelago.

It may be distinguished at first sight from *A. obesus* by the antero-lateral margins being armed with six acute spinuliform granules, behind the acute granuliform external angle of the orbits, arranged in three groups, two together.

The cephalothorax has precisely the same form as that of *Actumnus obesus*, and is uniformly covered on its upper surface with short yellow hairs. The regions are quite indistinct, no trace of divisional lines being found; the upper surface is *not* uniformly covered with granules as in *A. obesus*, but only a few acute granules (15–20) are found on the antero-lateral regions, which resemble the six granules with which the antero-lateral margins are armed, but are much smaller. The front, the gastric, cardiac, and intestinal regions are not covered with granules. The frontal margin is divided by a small median incision in two almost straight lobes, and passes laterally continuously into the upper orbital margin, not being separated by a cleft from the internal orbital angles. The frontal or inner part of the upper margin of the orbits makes nearly right angles both with the frontal and the external, somewhat granular portion of the upper orbital margin. The external angle of the orbits is formed by a small, acute, spinuliform granule. The antero-lateral margins are about as long as the postero-lateral, which are smooth and concave; they are armed with six small, acute, spinuliform granules, which are arranged in three groups, two in each. The inferior margin of the orbits is minutely granular, and presents a small triangular hiatus close to the external orbital angle. The pterygostomian regions are glabrous and nearly quite smooth, presenting only some minute granules near the inferior margin of the orbits. The outer surface of the maxillipeds, the sternum, and the lateral margins of the abdomen are clothed with yellow hairs.

The chelipedes are of unequal size, the right chelipede being the larger in all our specimens. The anterior margin of the arm, which is very short, the antero-internal margin of the wrist, and the upper margin of the hand and of the mobile finger are clothed with a row of long yellow hairs. The upper surface of the wrist and the outer surface of the larger hand are covered with similar yellow hairs, disposed between the granules with which they are provided. The larger hand wholly resembles that of *A. obesus*, its outer surface being covered everywhere with acute granules, disposed irregularly, those of the middle of the outer surface being a little larger than those of the upper; the under margin presents a longitudinal line of granules on the inner side, and is clothed with a row of long yellow hairs. The mobile finger is somewhat hairy and granular at the base, though much less than in *A. obesus*, the granules not extending beyond the proximal half of the finger. The outer surface of the fingers, the tips of which are pointed, is smooth. The inner surface of the hand is smooth, being only a little punctate at the base of the mobile finger. The smaller chelipede presents the same characters as the other.

The ambulatory legs are precisely similar to those of *A. obesus*, being clothed with rather long yellow hairs, but they are somewhat granular; the upper margin of the meropodites is minutely granular, and somewhat larger acute granules are observed on the upper surface of the carpopodites and propodites.

The cephalothorax of the largest specimen, a female, is 5¾ millim. broad; and the species probably attains a larger size.

37. ACTUMNUS NUDUS, *A. M.-Edw.* (Pl. II. figs. 2 & 3.)

Actumnus nudus, *Alph. Milne-Edwards, Descript de quelques espèces nouvelles de Crustacés Brachyures, Annal. Soc. Entom. de France*, 4ᵉ *sér.* t. vii. 1867, p. 265.

A single female specimen was collected in the Mergui seas. Prof. Milne-Edwards kindly identified it for me, and as his determination is doubtless correct, I now add a full description of the species.

The specimen is nearly twice as large as that described by Milne-Edwards. The cephalothorax is rather narrow, the proportion of the breadth to the length being as 4 to 3. The upper surface is very convex longitudinally, and also somewhat declivous towards the lateral margins. Interregional grooves are almost wholly wanting: I only observe a faintly indicated, shallow, cervical suture, separating the gastric region from the hepatic and branchial regions, and the usual shallow, median, frontal furrow, bifurcated behind, which separates the slightly prominent epigastric lobes from one another. The front, the epigastric lobes, the gastric region, and especially the antero-lateral regions are covered with pearl-shaped granules; on each side of the gastric region, ten or twelve of these granules are arranged in an arcuate line, with the convexity directed forward, which separates the antero-lateral region from the postero-lateral. Each antero-lateral region (hepatic and epibranchial) is covered with 30–35 perliform granules; the granules of the gastric region are not so numerous and a little less prominent, and a few small granules are observed immediately behind and close to the arcuate line of granules which I have described above. When the upper surface is examined with a sufficiently strong magnifying-glass it appears covered everywhere, anteriorly as well as posteriorly, with innumerable microscopic granules. A few short hairs are also sparsely distributed over the anterior half of the cephalothorax. The front, which is strongly deflected, measures about a third of the breadth of the cephalothorax. It is much advanced and divided by a small median, triangular incision into two rounded oblique lobes, the anterior margins of which are somewhat crenulate or uneven, and nearly continuous with the upper orbital margins, being separated from the internal angles of the orbits by a small and scarcely distinct cleft. The upper margin of the orbits is entire and covered with minute pearl-shaped granules, and the external angle of the orbits is very little prominent. The entire inferior margin of the orbits presents, close to the external angle, and separated from it by a narrow fissure or hiatus, a dentiform lobe which projects a little more forward than the external angle of the orbit itself. The internal lobe of the inferior orbital margin is dentiform and obtuse. The internal orbital hiatus is occupied by the peduncle of the external antennæ, the penultimate joint of which nearly reaches the front. The antero-lateral margins of the upper surface of the cephalothorax are scarcely longer than the postero-lateral, and are divided into five, little prominent, broad (=long) dentiform lobes, including the scarcely prominent external orbital angle. The third or middle lobe is the broadest (or longest) of all, the second and the fourth are a little broader (or longer) than the first (external angle of the orbits), the fourth being rather acute, and the last antero-lateral tooth is dentiform and also rather acute. The two last antero-lateral teeth are slightly carinate above, the carinæ being minutely granular; the granular carina of the fifth tooth is directed backward and slightly inward, and terminates at the postero-external end of the curved line of granules, which defines the antero-lateral from the postero-lateral regions, as is described above.

The inflected sides of the carapace, as the pterygostomian, subhepatic, and subbranchial regions, are nearly quite smooth; the under surface of the internal lobe of the inferior orbital margin is, however, somewhat granular, and the posterior end of the subhepatic region, which is situated below the two last anterolateral teeth, is also slightly granular. The anterior part of the subhepatic regions and the pterygostomian regions are glabrous, but the posterior half of the inflected sides of the cephalothorax are a little hairy. The endostome is distinctly longitudinally ridged on each side.

The specimen has unfortunately lost its larger chelipede, so that I can only describe the smaller one, the left. The arm is almost wholly covered by the cephalothorax, and its outer surface is smooth, the upper margin being a little hairy. The convex upper surface of the wrist is covered with some pearl-shaped granules, which are similar to those of the anterior part of the upper surface of the carapace. The distal end of the internal margin of the wrist is somewhat dentiform, and the internal surface of this joint is smooth.

The outer surface of the palm, as well as its upper and under margin, is covered with numerous, small, scarcely acute granules which are arranged irregularly, but the convex inner surface of the palm is smooth. The brownish-coloured fingers are a little shorter than the palm. They have pointed, crossing tips. The inner edges meet along their whole length; the inner edge of the immobile finger is distinctly crenulate, but the same edge of the mobile finger appears entire and is only very minutely crenulate. The outer surface of the immobile finger is longitudinally grooved and slightly granular; the mobile finger is also longitudinally sulcate on its upper margin and outer surface, and covered with granules between the grooves, the granules decreasing gradually in size towards the pointed tip.

The ambulatory legs are short, and, when compared with those of other species of this genus, tolerably slender. Their outer surface is smooth, but the upper margin of the joints, especially of the carpopodites and propodites, is minutely granular, and all the joints are slightly hairy along their upper and under margins. The dactylopodites are scarcely longer than the propodites, and terminate in rather long, acute, scarcely arcuate, corneous tips.

Dimensions of the specimen under notice :—

	millim.
Breadth of the cephalothorax (distance between the fourth or penultimate antero-lateral teeth)	11¾
Length of the cephalothorax	8¾
Breadth of the front	4

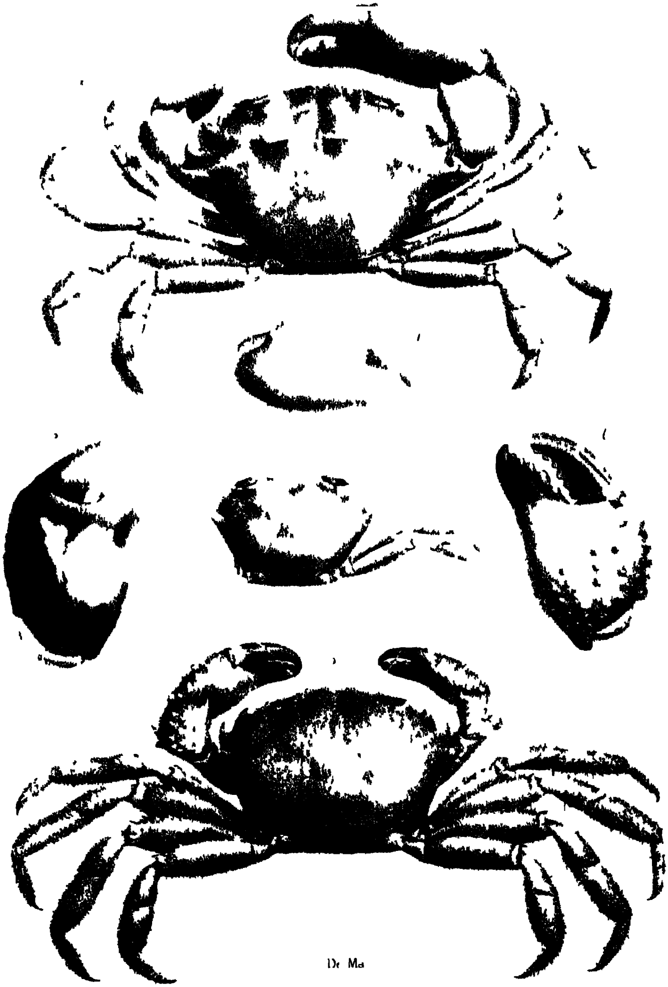
Actumnus nudus was discovered in 1867 at Pondicherry, but has not been recorded since, so far as I am aware.

Milne-Edwards's specimen had evidently lost the hairs with which the legs had been sparsely clothed.

Genus HETEROPANOPE, *Stimpson*.

The name *Heteropanope*, established by Stimpson in 1858, being of older date than the name *Pilumnopeus* of A. Milne-Edwards, I propose to include under the former a small number of Crustaceans from the Indo-Pacific region, which were described by Stimpson as representatives of *Heteropanope*, together with a few species described by A. Milne-Edwards, Miers, and Haswell under the name of *Pilumnopeus*. I may, however, remark that Stimpson also referred to his genus *Heteropanope* those species which are regarded as representatives of the genus *Epixanthus*. As regards the genus *Pilumnopeus*, two species have been described by the French carcinologist under that name, one of which, *Pilumnopeus maculatus*, is a true *Eurycarcinus*; whereas the second, named *Pilumnopeus crassimanus*, is probably identical with *Ozius serratifrons*, Kinahan, and also perhaps with Stimpson's *Heteropanope australiensis* (Miers, Zoology of the Voyage of H.M.S. 'Alert,' Crustacea, p. 228). I am the more inclined to retain the genus *Heteropanope*, because, when the genus *Pilumnus* is submitted to a thorough revision, it may be useful to refer to the former some species which still bear the name of *Pilumnus*.

The glabrous or scarcely hairy cephalothorax of most species of *Heteropanope* is little convex (except that of *H. serratifrons*) and but little enlarged; the lateral margins are armed with four or five more or less prominent teeth, which are never spiniform, and the front is more or less prominent. The external antennæ resemble those of *Pilumnus*, the basal joint being small and not nearly reaching the front. The endostome is longitudinally ridged. The inferior margin of the orbits, which are transverse,



De Man

1, 2 HETEROPANOPE [illegible] 3, 4 H. EUCRATOIDES
5, 6 PILUMNUS ANDERSONI

Crowther lith. Mintern imp.

presents a small hiatus close to the external orbital angle. The abdomen of the male is seven-jointed, and the legs resemble those of *Pilumnus*.

The genus *Epixanthus* is distinguished from *Heteropanope* by its different physiognomy—the cephalothorax is more enlarged, the orbits are circular, the hands, and especially the fingers, are more slender, and the basal joint of the external antennæ, which is united with the front, is large.

As regards the genera *Eurycarcinus* and *Pilumnus*, in the latter of which I propose to include those species the carapace of which is more or less hairy and armed with spiniform antero-lateral teeth, it is unnecessary to say that they are generically scarcely distinct from *Heteropanope*, but that at the same time they are sufficiently characterized by their whole outer physiognomy.

I include in the genus *Heteropanope* the following species:—*H. serratifrons*, Kinahan; *H. glabra*, Stimps.; *H. australiensis*, Stimps.; *H. eucratoides*, Stimps., *H. crassimana*, A. M.-Edw.; *H. granulosa*, Miers, and *H. indica*, n. sp,—observing, however, that *H. australiensis* and *H. crassimana* are probably identical with *H. serratifrons*.

38. HETEROPANOPE INDICA, n. sp. (Pl. III. figs. 1 & 2.)

Two specimens, a male and a female, were collected in the Mergui Archipelago

The cephalothorax of this pretty small Crustacean is broader than long; the distance between the third antero-lateral teeth, where the cephalothorax is broadest, being in proportion to the length as 15 to 10½. The upper surface is rather depressed, though somewhat declivous towards the front and the lateral margins; it is covered with a few, sparsely distributed, minute hairs, which are, however, scarcely visible to the naked eye. The regions of the upper surface are faintly marked by shallow inter-regional grooves. The upper surface is smooth posteriorly; on the anterior half it is marked with some transverse, minutely granulated, pubescent, elevated lines, five on each side. Two small elevated lines are found on the epigastric lobes, separated from one another by the faint mesial frontal furrow. Two other transverse ridges occur on each protogastric lobe, placed in the same transverse line near one another, the external of which is only half as broad as the internal ridge. Lastly, two parallel, slightly oblique, elevated lines are seen near the third and the fourth antero-lateral teeth, the posterior of which is twice as broad as the anterior. Although I have described the upper surface as being smooth, I may, however, remark that it is minutely granular near the postero-lateral margins, which are but little longer than the antero-lateral. The distance between the third antero-lateral teeth is three times as great as the distance between the internal orbital angles. The front is somewhat declivous, and consists of two slightly oblique lobes, which are separated from one another by a small triangular incision; these lobes are rather prominent in the middle, and their minutely granular anterior margin is broadly emarginate towards the external angle, so as to constitute a small tooth at the external angle of each lobe. Each frontal lobe is marked above with a slightly arcuate, transverse, granular line, and is covered with some granules between this line and the anterior margin. The frontal lobes, which therefore somewhat resemble those of some species of *Leptodius*, are separated by a small notch from the little prominent, internal orbital angles. The orbits are transverse, being a little broader than long. The granular upper margin of the orbits is marked with two fissures on the external half; the granulated or minutely denticulated under margin presents a strong, rather obtuse, tooth at the internal angle, which is a little more prominent than the internal angle of the upper margin, projecting nearly as much forward as the small external teeth of the frontal lobes. The infraorbital margin is marked with a small triangular hiatus close to the little prominent external angle of the orbits.

The antero-lateral margins are armed with four prominent teeth, including the external orbital anglo. The first tooth is rather broad, and its external margin is slightly emarginate; the second tooth much resembles the first, but it is a little narrower and more triangular; the third tooth is the most prominent of all, being triangular, rather acute, and directed obliquely forward; the fourth tooth resembles the third, but is much smaller and much less prominent. The last two teeth are somewhat carinate and granular above, and the external margins of all the antero-lateral teeth are granular.

The inflected sides of the cephalothorax are somewhat granular and hairy, but the pterygostomian regions do not present a tubercular eminence, as in *H. serratifrons*, or a small tooth, as in *H. australiensis*. The basal joint of the external antennæ is short and small, and does not nearly reach the front; the other joints occupy the internal orbital hiatus, and the flagellum is rather short, measuring only a fourth of the distance between the third antero-lateral teeth. The endostome is distinctly longitudinally ridged on each side. The epistome is nearly smooth. The male abdomen is seven-jointed, the joints being all distinctly separated from one another; it closely resembles that of some *Pilumni*, and the penultimate joint is nearly quadrate, being scarcely broader than long. The sternum and the abdomen are smooth, though somewhat pubescent, and the lateral margins of the female abdomen are fringed with rather long hairs.

The chelipedes are very unequal, the right being the largest in both specimens; although the larger chelipede of the female specimen is wanting, I suppose that the anterior legs present the same size both in the male and in the female. The arms are short, scarcely projecting laterally beyond the lateral margins of the cephalothorax; they are armed near the distal end of the upper margin with a strong, acute, somewhat curved tooth. The under margin is entire, but the anterior margin is somewhat granular and hairy. The external (or posterior) surface of the arm is minutely granular near the upper margin, but otherwise the arms appear smooth. The wrist is armed with a small, scarcely acute tooth at the distal and internal angle; its upper surface appears smooth to the naked eye, but, when seen under a lens, some small granules are observed near the internal and external margins, especially on the wrist of the smaller chelipede. The larger hand is very large, its length (the fingers included) being but little shorter than the breadth of the cephalothorax, *i. e.* the distance between the third antero-lateral teeth. The fingers are nearly half as long as the palm, which is but little longer than broad (high). The outer surface of the palm is rather convex and quite smooth, and the obtuse upper and under margins, like the inner surface, are also perfectly smooth. The fingers have pointed tips, which cross one another; they are nearly smooth, the immobile finger presenting only a trace of a longitudinal impressed line on its outer and inner surfaces, and the mobile finger being slightly granular above at the articulation. The latter presents a somewhat larger tooth at its base, and the other finger is armed with two or three teeth along its inner margin. Whereas the larger hand is quite smooth and glabrous, the upper and under margins and the outer surface of the palm of the much smaller left hand are covered with distinct granules and with sparsely distributed hairs. In the smaller hand the fingers also are comparatively longer than in the larger hand, being but little shorter than the palm; they are distinctly longitudinally sulcate, but are only indistinctly denticulate. The mobile finger is somewhat granular and hairy above near the articulation with the palm.

Regarding the ambulatory legs, I may remark that the three anterior pairs have nearly the same length, but that the last pair are distinctly shorter. They are somewhat hairy, especially the last three joints. The dactylopodites are almost as long as the propodites, and terminate in small horny tips.

Dimensions of the male specimen:—

	millim.
Length of the cephalothorax	$10\frac{1}{2}$
Breadth of the cephalothorax (distance between the third antero-lateral teeth)	15
Distance between the internal orbital angles	5
Length of the larger hand (fingers included)	14
Length of the palm	9
Height of the palm near the articulation with the fingers	7

39. HETEROPANOPE EUCRATOIDES, *Stimps.* (Pl. III. figs. 3 & 4.)

Heteropanope eucratoides, *Stimpson, Proceed. Acad. Nat. Sciences Philadelphia,* 1858, p. 33.

A single male specimen of this rare species was found at Elphinstone Island.

This species is closely allied to the preceding, but it presents a different external appearance, on account of the antero-lateral margins being comparatively much shorter in proportion to the postero-lateral, and because the third antero-lateral tooth is not the largest but the smallest of all, so that the cephalothorax is broadest at the fourth antero-lateral teeth.

As in *Heteropanope indica,* the upper surface of the cephalothorax is rather depressed and scarcely convex, being only somewhat declivous towards the anterior and lateral margins. The cephalothorax, however, is a little less enlarged, the proportion of its breadth (*i. e.* the distance between the fourth antero-lateral teeth) to the length being as 12½ to 9. As regards the structure of the upper surface of the cephalothorax, this species nearly completely agrees with *H. indica*, the anterior half presenting the same minutely granulated transverse elevated lines, in the same number, and arranged in the same manner; the inter-regional grooves, however, are a little more distinct, and the metabranchial regions, which are situated on each side of the cardiac region, are minutely granular. In the form of the front and in their orbits, both species closely resemble each other, so that one description suffices for both; but the anterior margin of the frontal lobes in this species is widely and more faintly emarginate, so that the external angles are much less prominent and not dentiform as in *H. indica*. The antero-lateral margins are comparatively much shorter than those of *H. indica*, so that a transverse line, uniting the fourth antero-lateral teeth divides the upper surface into two portions of very different length, the length of the anterior portion being in proportion to that of the posterior as 1 to 2. The antero-lateral margins are divided into four prominent teeth, including the external orbital angles. The first or anterior tooth is rather small, and much resembles the first antero-lateral tooth of *H. indica*, the external margin being slightly emarginate. The second tooth is a little broader than the first, more prominent and rather obtuse; the third is the smallest of all, triangular, and much less prominent than the second and the fourth. The last tooth is conical and prominent, granulated above and moderately acute. The margins of the teeth are almost smooth. The inflected sides of the cephalothorax are nearly smooth, and only a little granular near the antero-lateral teeth; they do not present the tubercular eminence or tooth which is so characteristic of *H. serratifrons* and *H. australiensis*.

The outer antennæ, the smooth epistome, and the anterior margin of the buccal cavity fully agree with *H. indica*. As in the latter, the endostome is distinctly ridged on each side. The external maxillipeds closely resemble those of *H. indica*; Stimpson's words, "Hectognathopoda sat hiantia," are therefore inexplicable to me, seeing that the external maxillipeds of the species of *Heteropanope* perfectly resemble those of *Pilumnus*. The male abdomen is similar to that of *H. indica*, but the terminal joint is comparatively a little longer. The sternum and abdomen are minutely pubescent posteriorly. Unfortunately the specimen has lost its smaller chelipede. The chelipede which is present perfectly resembles the larger chelipede of *H. indica*, so that I again refer to my description of that species. I will only add that the chelipede is quite smooth everywhere on all the joints, and that the denticulate upper margin of the arm is furnished near its distal end with a strong tooth, which is, however, a little less acute than in the preceding species.

The ambulatory legs are also wanting, except those of the two anterior pairs of the right side; these agree with those of *H. indica*, but the dactylopodites are a little more elongate, being distinctly longer than the propodites.

Dimensions.

	millim.
Length of the cephalothorax	9
Breadth of the cephalothorax (distance between the fourth antero-lateral teeth)	$12\frac{1}{4}$
Distance between the internal orbital angles	$4\frac{2}{3}$
Length of the hand (the fingers included)	10
Height of the hand at the base of the fingers	$5\frac{3}{5}$

The specimen under description, as in fact the whole collection, is preserved in alcohol. This species is, like *H. indica*, of a dark olive-green colour. The diagnosis given by Stimpson very well agrees with my description, except that the three posterior antero-lateral teeth are described as being acute, whereas in this specimen the second is rather obtuse.

Stimpson discovered this species at Hongkong.

Genus PILUMNUS, *Leach*.

40. PILUMNUS VESPERTILIO, *Fabr*.

Cancer vespertilio, *Fabricius, Suppl. Entom.* 1798, p. 338.

Pilumnus vespertilio, *Milne-Edwards, Hist. Nat. Crustacés*, t. i. p. 418, and *Règne Animal de Cuvier*, pl. xiv. fig. 3.

Pilumnus vespertilio, *Alph. Milne-Edwards, Nouv. Arch. du Muséum Hist. Nat.* t. ix. p. 242; *Hilgendorf, Monatsber. k. Akad. Wiss. Berlin*, Nov. 1878, p. 793; *Miers, Ann. & Mag. Nat. Hist.* 1880, 5th ser. vol. v. p. 234; *Haswell, Catalogue &c.* p. 65.

Eight specimens were collected at Elphinstone Island, five males and three females.

These specimens agree very well with the description and figure given by Milne-Edwards, but I may add the following details.

In all the eight specimens the upper margin of the orbits is more or less granular, and presents *two* fissures, so that this species belongs to the subgenus *Eupilumnus*, established by Kossman (Mr. Miers, *l. c.*, erroneously mentioned the subgenus *sensu stricto Pilumnus*). In all the under margin of the larger hand is covered with rounded granules, except in the two largest males, in which the granulation of the under surface of the larger hand gradually begins to disappear. According to Dr. Hilgendorf (*l. c.*), in the true *P. vespertilio* the under surface of the larger hand is somewhat granular in the male but everywhere granular in the female, so that there can be no doubt that these specimens are really representatives of this species.

Pilumnus ursulus, Ad. & White, and *Pilumnus mus*, Dana, are identical with this species, according to Mr. Miers.

Pilumnus vespertilio is a very common species, distributed throughout the whole Indo-Pacific region, having been observed in the Red Sea (*Kossmann*), at Mozambique (*Hilgendorf*), Java (*Miers*), Sydney (*Hess*), and on the coral-reefs of Australia (*Haswell*), at New Caledonia, the Loo-Choo Islands, and Japan (*Stimpson*).

41. PILUMNUS ANDERSONI, n. sp. (Pl. III. figs. 5 & 6.)

Four specimens (1 ♂, 3 ♀) of this new species were collected by Prof. Anderson in the Mergui Archipelago, two of which were found at Elphinstone Island and two at King Island. One of the female specimens is provided with eggs and another is infested in its cephalothorax with a *Bopyrus*. Courage, indeed, is necessary to describe a new species of this genus, for the very numerous species of *Pilumnus*, which often closely resemble one another, are rather insufficiently known. I therefore sent a specimen to Prof. Milne-Edwards, who informed me that this species was unknown to him, although closely allied to *Pilumnus Peronii*, M.-Edw., as I also supposed. As regards the species which have been described by Stimpson, Hilgendorf, Miers, and Haswell, I may remark that *P. Andersoni* is allied to *P. hirsutus*, Stimps., *P. longicornis*, Hilg., *P. Bleekeri*, Miers, *P. terræ-reginæ*, Hasw., and *P. vestitus*, Hasw., but is nevertheless a distinct species in my opinion.

The following is the description of the largest specimen, a female, found at Elphinstone Island.

In its outer appearance *P. Andersoni* somewhat resembles the common Indian *P. vespertilio*, Fabr., but it is of smaller size and much less hairy. The cephalothorax is about once and a half as broad as long, the proportion of the breadth to the length being as 25 to 18. The upper surface is tolerably convex longitudinally, and much less convex transversely; it is much declivous anteriorly towards the front, and also somewhat towards the lateral margins. The regions are faintly and only partly indicated, the inter-regional grooves, so far as they are present, being rather shallow. The two small, rounded, epigastric lobes, which are separated as usual from one another by the median frontal furrow, are a little prominent; the frontal furrow is bifurcated immediately behind them, and the two parallel grooves into which it is divided, which border the mesogastric area, diverge backwards and terminate in the gastrobranchial grooves. The latter are very shallow though yet distinct; their external transverse portions, separating the hepatic and epibranchial regions from one another, are a little deeper than the median portion, and the upper orbital margins are surrounded by a shallow groove which separates these margins from the hepatic and protogastric regions. Behind the cervical suture no other divisional lines are visible. The upper surface of the cephalothorax is covered with some very small granules anteriorly and on the postero-lateral margins: the front, the epigastric lobes, the protogastric regions, and the mesogastric area are covered with minute granules, whereas the granules of the slightly prominent hepatic region and of the anterior margin of the epibranchial region are a little larger. The granules are nevertheless scarcely visible to the naked eye. As I have already observed, some small granules are also found on the postero-lateral margins, but the rest of the upper surface is not granular behind the cervical suture. The upper surface is everywhere minutely punctate and covered with a short down, which conceals the minute granulation of the anterior half.

The front measures a third of the breadth of the cephalothorax, and is considerably deflexed and slightly prominent; as in *P. vespertilio*, it is divided by a triangular median incision into two broad, rather truncate, and slightly oblique lobes, with minutely granulated anterior margins, external to which a small acute tooth is present on each side, which is separated from the median lobes and from the obtuse, slightly granular, internal orbital angles on each side by a small cleft. The orbits have the usual size and form; the upper orbital margin presents two fissures by which it is divided into three portions, the two external of which are covered with a few granules, whereas the much larger internal portion is almost smooth.

The external orbital angle is little prominent, and not spiniform; it is separated by a small hiatus from the inferior orbital angle, which is denticulate, being armed with six or seven acute teeth besides the also denticulate internal lobe, which projects as much forward as the external frontal teeth. The antero-lateral margins are shorter than the postero-lateral; they are armed, behind the little prominent external orbital angle, with three acute, dark-pointed, spiniform teeth. The external margin of the first antero-lateral tooth, *i. e.* the outer orbital angle, is minutely denticulate, and the external margin of the second antero-lateral tooth, which is spiniform, is also somewhat granular at its base. The external margins of the two posterior antero-lateral teeth are quite smooth. A subhepatic spine which occurs in so many species of this genus is wanting in *P. Andersoni*, its place being occupied by a small, somewhat prominent, acute granule. The postero-lateral margins are straight and very slightly concave. The posterior margin of the carapace is bordered by an impressed line, running close to and parallel with it. The external antennæ are long, measuring twice the distance of the internal and external angles of the orbits, and they reach almost to the penultimate antero-lateral spine. When the cephalothorax is viewed from above, the antennal peduncle is visible in the cleft or hiatus that separates the internal orbital angles from the external frontal teeth; its basal joint, which scarcely reaches a process of the external frontal tooth, is twice as long and nearly twice as broad as the next or penultimate joint. The terminal joint projects beyond the front, and is scarcely shorter than the second joint.

The subhepatic and pterygostomian regions of the carapace are covered with a short down and with numerous minute granules; those which are found on the anterior portion of the subhepatic region are a little larger than the others. The endostome is distinctly longitudinally ridged. The anterior margin of the epistome is granular, the posterior margin, *i. e.* the anterior margin of the buccal cavity, is sharp, and similar to that of

P. vespertilio. The outer foot-jaws also resemble those of that species; they are covered with a short pubescence and fringed with yellow hairs along their inner margins. The sternum and the abdomen are covered with a short down, the abdomen, both in the male and in the female, being similar to that of *P. vespertilio.* The abdomen of the female is fringed with long hairs on the lateral margins.

The chelipedes are very unequal: in three specimens the right hand is the largest, in the fourth it is the left. The anterior margin of the basipodites is armed with three or four acute granules. The arms scarcely project beyond the lateral margins of the cephalothorax; the upper margin is armed with two somewhat arcuate, dark-pointed, acute spines at the distal end, the larger of which is situated a little behind the distal spine, which is itself accompanied by a somewhat smaller spine at its base. Behind these large spines the upper margin is further armed with four or five acute granules, which gradually decrease in size towards the proximal end. The anterior margin of the arm presents three or four acute teeth along its proximal half, and the under margin is also granulo-spinulous. The under surface of the basipodites and of the arms is a little granular; the concave inner and the scarcely convex outer surfaces are a little punctate but nearly smooth, the outer surface being only slightly granular near its margins. The wrist is armed, at its internal angle, with an acute spine, and the upper surface is granulo-spinulous, being covered with many small acute tubercles or granules, especially along the inner margin and anteriorly (distally). In its outer appearance the larger hand is similar to that of *P. vespertilio.* The larger hand is nearly twice as long as high (at the base of the fingers), the fingers being included, and quite as long as the length of the cephalothorax. The convex outer surface of the palm is more or less granulo-spinulous on the upper margin and on a proximal area; around the articulation of the wrist, the distal portion of the palm, and the rounded under margin are quite smooth and glabrous. As already remarked, the size of the granulo-spinulous area of the outer surface of the palm is a little variable, the smooth portion of the outer surface being in some specimens larger than in others. In one of the specimens from King Island, the whole under margin of the palm is smooth, and the granules are even wanting at the distal end of the upper margin, so that the granulo-spinulous area only occupies the proximal third of the outer surface. In the largest specimen, on the contrary, the larger proximal half of the outer surface is granulo-spinulous, and some granules are also found at the proximal end of the under margin. The granules of the granulo-spinulous area are of unequal size and are acute; some larger granules are often observed in two rows on the upper margin, and irregularly spread over the outer surface, whereas others of smaller size are distributed between the large granules. In other specimens the granules which are found on the upper margin are smaller than those of the outer surface. The somewhat convex inner surface of the palm is quite smooth in the three smaller specimens, but a little granular on the middle in the largest. The dark-coloured fingers are shorter than the palm, and are nearly similar to those of *P. vespertilio*; they meet along their inner margins, and have pointed, crossed tips. The mobile finger is covered above at its base with a few granules, but otherwise it is quite smooth and glabrous, presenting, however, some longitudinal lines of punctulations. The inner edge is feebly denticulate, a somewhat larger (longer) tooth being found at the base, and the inner surface bears a few small tufts of short hairs along the inner edge. The immobile finger presents an impressed, punctate, longitudinal line on the outer and on the inner surface; its inner margin is provided with six teeth, which are stronger than those of the mobile finger, and the third of which is the largest; on the inner surface this finger also bears a few tufts of short hairs.

The hand of the smaller chelipode is much smaller and comparatively more slender than the larger hand. The smaller hand is a little shorter than the other, but much lower, its height measuring scarcely more than a third of the length, the fingers included. The whole upper surface of the palm, including its upper and under margins, is covered with some large acute granules, which are comparatively a little larger than those of the larger hand, and are mostly arranged in six or seven longitudinal rows, two of which are found on the upper margin. The inner surface of the palm presents some acute granules. The fingers of the smaller hand, which are shorter than the palm, meet along their inner margins, and have also pointed crossed tips. The lower finger is slightly deflexed, and rather profoundly sulcate both on its outer and its inner surface; the inner margin is armed with five or six teeth. The mobile finger, which is a little granular and hairy above at the base, is also profoundly sulcate, and, as in the larger hand, its inner edge is more feebly denticulate than the lower finger. Both fingers present a few small tufts of short hairs internally along the inner edges.

The ambulatory legs resemble those of the European *P. hirtellus*, and are tolerably slender. The upper margins of the meropodites are armed with some acute spinules along their distal half, one of which is constantly found at the distal end; the other joints are unarmed. The dactylopodites are straight, a little shorter than the propodites, and terminate in an acute, slightly arcuate, horny tip.

The anterior legs are everywhere covered with a short pubescence, except the smooth distal portion of the outer surface of the larger hand, which is quite glabrous; the inner surface of the palms and the fingers are also glabrous and naked. The ambulatory legs present everywhere the same pubescence, and are fringed moreover along their upper and under margins with rather long hairs, especially along those of the last three joints.

Dimensions of the largest specimen:—

	millim.
Length of the cephalothorax	13½
Breadth of the cephalothorax, the lateral spines included	18¾
Distance between the internal orbital angles	6⅕
Length of the larger hand	13½
Height of the larger hand at the base of the fingers ..	6½
Length of the smaller hand	10¾
Height of the smaller hand	4⅕
Length of the ambulatory legs of the penultimate pair .	32

The female bearing eggs is 15 millim. broad.

According to Prof. Milne-Edwards, this new species differs from *Pilumnus Peronii*, M.-Edw., by a less globular cephalothorax, the upper surface of which is more granular, by a less advanced front, and by more pointed and more delicate antero-lateral spines.

P. cursor, A. M.-Edw., from New Caledonia and Upolu, is also closely allied to our species. In *P. cursor*, however, a typical specimen of which I have before me, the inter-regional grooves are more distinctly indicated, the whole outer surface of the larger hand is covered with granules, and the fingers of the larger hand are profoundly sulcate, at least in the typical specimen, which

TREASURER'S Account for the year from May 1, 1886, to April 30, 1887. (F [illegible] Anniversary Meeting, Tuesday. May 24, 1887.)

Receipts and Payments.

Receipts.				£	s.	d.
Balance at Bankers' on 1st May, 1886				381	12	9
Interest on Investments				190	14	0
Admission Fees				288	0	0
Annual Contributions				1260	3	0
Compositions				180	0	0
Sales of Publications:—						
Transactions	£145	16	7			
Journals	116	10	10			
Proceedings and Catalogues	3	1	6			
				265	8	11
Donation				113	10	2
				£2679	8	10

Payments.				£	s.	d.
Taxes and Insurance				22	13	9
Repairs and Furniture				38	0	10
Coals and Gas				69	5	0
Salaries and Commission				431	13	4
Library:—						
Books	£140	6	5			
Binding	82	8	2			
				222	14	7
Expenses of Publications:—						
Printing	£583	15	6			
Illustrations	631	5	5			
Distribution	68	7	4			
				1283	8	3
Miscellaneous Printing and Stationery				65	14	0
Petty expenses (including Tea and Postage)				74	10	4
Investment				150	0	0
Balance at Bankers' on 30th April, 1887				321	8	9
				£2679	8	10

Investments on 30th April, 1887.

	£	s.	d.
Consols	3511	19	0
Metropolitan Board of Works 3½ per cent. Stock	1184	15	11
Great Indian Peninsula Railway 5 per cent. Guaranteed Stock	938	14	0
Do. Do. Do. 4 per cent. Debenture Stock	108	0	0
Forth Bridge Railway Co. 4 per cent. Stock	495	0	0
	£6238	8	11

FRANK CRISP, *Treasurer.*

The foregoing accounts have been examined and found correct.

FRED. V. DICKINS, ALBERT D. MICHAEL,
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May 12, 1887.

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THE irregularity in the issue of Numbers of the Journals in sequence is due to separate Volumes being issued concurrently.

Journal of Zoology.

Vol. XX., when completed, will contain **Nos. 116 to 125** inclusive.

Of this Volume there has been published Nos. 116, 117, and 118.

Vol. XXI.—Devoted to the Fauna of the Mergui Archipelago, when completed, will contain **Nos. 126 to 135** inclusive.

Of this Volume there has been published Nos. 126, 127–128, and 129.

Vol. XXII. will consist only of Dr. De Man's Crustacea of the Mergui Archipelago, commencing **No. 136**, and this Volume may run to six Parts.

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THE JOURNAL OF THE LINNEAN SOCIETY.

Vol. XXII. ZOOLOGY. No. 137

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(Part II., with Plates IV.–VIII.)

See Notice on last page of Wrapper.

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I am comparing, which is scarcely more than 14 millim broad.

P. hirsutus, Stimps., from the Corean seas, differs from *P. Andersoni* by the larger hand being only granulated on its upper margin, and not at all on its outer surface. (See Miers, Proc. Zool. Soc. 1879, p. 31.)

Hilgondorf's *P. longicornis*, from the coast of Mozambique, may be easily distinguished from *P. Andersoni* by its antero-lateral teeth, which are not spiniform. *Pilumnus Bleekeri*, Miers, from New Guinea, presents a spiniform extraorbital angle and a distinct subhepatic spine.

Pilumnus terræ-reginæ, Hasw., from Queensland, presents a patch of small granulations on the mesobranchial regions (which in *P. Andersoni* are smooth), the granules on the larger hand are rounded, and it has a row of obscure granules on the lower border of the merus and hand of the smaller chelipede.

The upper surface of the cephalothorax of *P. vestitus*, Hasw., also from the eastern coast of Australia, is described as presenting no distinct granules, whereas in this species the upper surface is distinctly granulate anteriorly, as already mentioned. *P. vestitus*, however, appears closely allied to *P. Andersoni*, and a more exact knowledge of it is desirable.

42. PILUMNUS SEMINUDUS, *Miers.*

Pilumnus seminudus, *Miers, Crustacea of the Voyage of H.M.S. 'Alert,'* 1884, p. 222, pl. XXI. fig. C.

A young female crab found at Owen Island I believe to belong to the above-named species.

The cephalothorax is rather enlarged, the proportion of the breadth to the length being about as 7 to 5. The upper surface, which is a little convex longitudinally and somewhat declivous towards the lateral margins, presents no trace of divisional inter-regional grooves, and is everywhere clothed with a close velvety pubescence. I only observe a very faintly indicated mesial longitudinal furrow. The front is nearly straight and presents a small median incision; the two lobes into which the front is thus divided are *not* separated by a notch from the internal orbital angles, so that the latter constitute at the same time the external angles of the front. The orbital margins are minutely denticulate, though the denticulation of the upper margin is scarcely visible; the internal angle of the lower border is not at all prominent. The antero-lateral margins are scarcely shorter than the postero-lateral and are armed behind the external angles of the orbits, which are not at all prominent, with four teeth, the anterior one of which is represented by a rather blunt, low, rounded prominence which is itself crenulate. The second resembles the first in being crenulate, but it terminates in a minute spine, and the two posterior teeth are distinctly spiniform. There is no trace of a subhepatic tooth or spine. The endostome is faintly ridged.

The chelipedes and the other legs seem to resemble those of the specimens collected during the voyage of H.M.S. 'Alert.' The left chelipede is much larger than the right and granular, some larger granules of the outer surface of the palm being arranged in longitudinal series. The hand of the smaller chelipede is very hairy externally. The small specimen is only 7 millim. broad and scarcely 5 millim. long.

This species is somewhat allied to *Pilumnus Dehaanii*, Miers, from the Japanese seas, but *P. seminudus* has a more enlarged cephalothorax. Although Miers's specimen agrees very well with the description of *P. seminudus*, I would point out that the existence of *four* antero-lateral teeth has not been clearly indicated by the English carcinologist, and that the granules with which the anterior legs are covered are rather conspicuous.

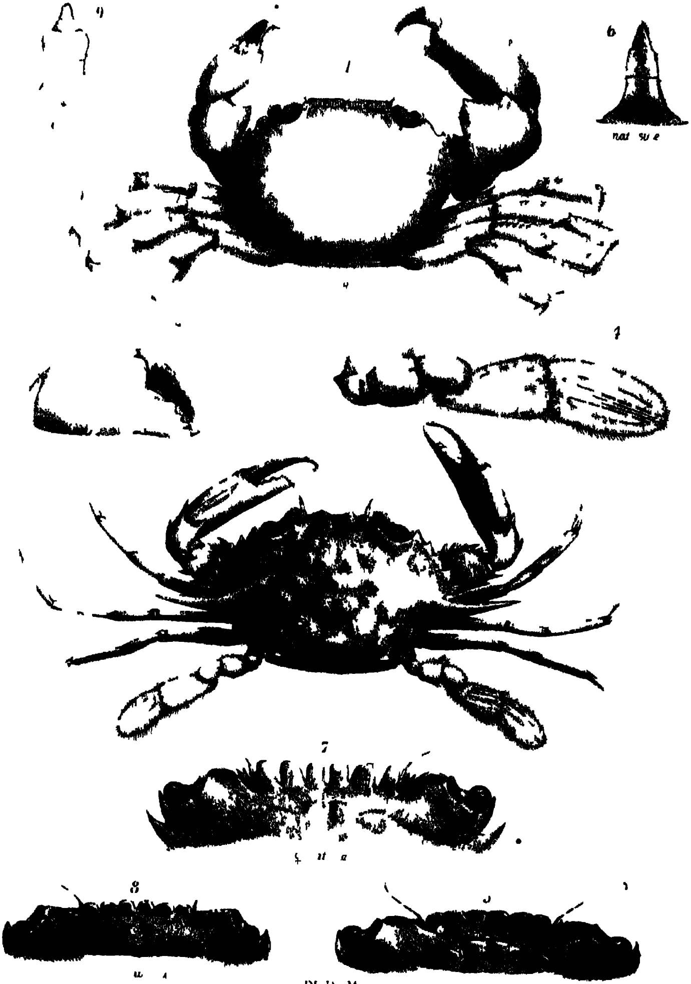
Pilumnus seminudus has been recorded from the eastern and north-eastern coasts of Australia (Port Denison, Torres Strait).

43. PILUMNUS LÆVIS, *Dana*. (Pl. IV. figs. 1 & 2.)

Pilumnus lævis, *Dana, Conspectus Crustaceorum &c. in Proc. Acad. Nat. Sci. Philadelphia*, vol. vi. p. 82 (May 1852).

Two specimens (♂ ♀), not yet full-grown, were collected at Sullivan Island.

In this small species the carapace is broader than long, the proportion of the distance between the last antero-lateral teeth to the length of the cephalothorax (the basal portion of the abdomen, as far as it is visible from above, excluded) being about as 7 to 5. The upper surface is a little convex and perfectly smooth; the regions are quite indistinct, there being no trace of divisional lines, except the usual longitudinal median furrow on the front, which separates the epigastric regions and the usual transverse cervical suture. The upper surface is, however, a little hairy, and presents three elevated transverse lines, which are clothed



M. chae lith. Dr. De Man. Mintern imp.

1 2 PILUMNUS LÆVIS 3 4 NEPTUNUS ANDERSONI
5 6 THALAMITA PRYMNA 7 T. SPINIMANA 8 9 T. DANÆ

with longer hairs, namely—one on the front between the orbits, parallel with the frontal margin, and one on each side of the carapace, starting from the last antero-lateral tooth, separating the antero-lateral portion of the cephalothorax from the postero-lateral, but not reaching as far as the gastric region.

The front is a little broader than a third of the distance between the last antero-lateral teeth, the proportion of that distance to the breadth being as 23 to 9, it is somewhat declivous and divided by a small median triangular notch into two rather prominent and slightly oblique lobes, with a nearly straight or slightly emarginate anterior margin. The frontal lobes are not continuous with the orbital margin but separated laterally from the internal orbital angles by a small angular cleft The orbital margins, both the superior and the inferior, are entire and not denticulate; the upper margin presenting moreover no incision, this species belongs to the subgenus *Parapilumnus*, Kossmann.

The external orbital angle is not at all prominent and the antero-lateral margins of the cephalothorax, which are a little shorter than the postero-lateral, are armed with three small spiniform teeth behind the angle of the orbits, the last being a little smaller than the two anterior ones.

The pterygostomian regions are perfectly smooth and there is no trace of a subhepatic spine. As regards the male abdomen, I will only remark that the penultimate joint is a little broader than long

The anterior legs or chelipedes are of unequal size, and in both the specimens the right is the larger The larger chelipede is everywhere smooth and glabrous, and does not present even a trace of granulation, but appears polished and shining The arm is very short, scarcely extending beyond the lateral margins of the carapace; its anterior margin is armed with two or three small acute teeth The wrist has a polished convex upper surface, and is armed at its internal angle with a short though acute tooth. The hand is very large, like the wrist, and nearly as long as the breadth of the cephalothorax, its surface is everywhere smooth, convex, polished, and glabrous The fingers are also smooth, not sulcate, and their pointed tips cross one another.

The smaller chelipede resembles the larger, but the wrist and the hand are a little hairy and the mobile finger is slightly sulcate longitudinally.

The ambulatory legs are tolerably slender, resembling those of *Pilumnus cursor*, A. M.-Edw., and they are slightly hairy.

In the larger specimen, the male, the distance between the last antero-lateral teeth measures only 4⅗ millim., the cephalothorax being 3⅖ millim. long. According to Dana the carapace of the adult is nearly 3‴ broad.

This little crustacean has hitherto only been recorded from the Strait of Balabac.

Genus ERIPHIA, *Latr.*

44. ERIPHIA LÆVIMANA, *Latr.*

Eriphia lævimana, *Latreille, Milne-Edwards, Hist. Nat. Crust.* t. i. p. 427; *Heller, Crustaceen der Novara-Reise*, p. 24; *Stimpson, l. c.* p. 35; *Alph. Milne-Edwards, l. c.* p. 255.

See also:—*Miers, On Malaysian Crustacea, Ann. & Mag. Nat. Hist.* 1880, 5th ser. vol. v. p. 237; and *Hilgendorf, Monatsber. k. Akad. d. Wiss. Berlin*, Nov. 1878, p. 797.

Ten fine specimens of this species are in the Collection, three very young males and seven adult females; four of them were collected at Sullivan Island, four at Owen Island, one at King Island, and one at Elphinstone Island.

In all the adult females the outer surface of the wrist and of the hands in both chelipedes is wholly smooth and without tubercles, so that they are typical representatives of this species; but in the smallest male specimen from Owen Island, the carapace of which is only 10 millim. broad, the outer surface of both chelipedes is covered with crowded acute tubercles. These tubercles, however, have already begun to disappear in a male a little larger from the same locality, which has a carapace 14 millim. broad; the tubercles in this specimen only occur on the outer surface of the smaller hand, and are even much less developed than in the smallest male individual. I conclude, therefore, that very young male specimens of *E. lævimana* present this tuberculation, which, however, soon disappears.

The Collection in the Leyden Museum contains two specimens from the Moluccas and one from Amoy, in which the outer surface of the larger hand is smooth, but that of the smaller tuberculated.

Eriphia lævimana, the type species, the chelipedes of which are wholly smooth, has been collected on the coasts of Mozambique and Natal, at Mauritius the Nicobar Islands, and the Malayan

Archipelago. The Leyden Museum contains specimens also from Padang, Timor, Xulla-Bessy, Gebeh, Amboina, and Halmahera. It has also been found on the coast of New Caledonia and on many islands of the Pacific Ocean, the Fiji and Samoa Islands, and the Paumotu Archipelago; it is, moreover, recorded from the Philippines, the Loo-Choo Islands, and even from the Japanese seas (Stimpson).

Genus TRAPEZIA, *Latr.*

45. TRAPEZIA CYMODOCE, *Herbst.*

Cancer cymodoce, *Herbst, Krabben und Krebse*, iii. pl. li. fig. 5.

Trapezia dentata, *Alph. Milne-Edwards, Nouv. Arch. du Muséum Hist. Nat.* 1873, t. ix. p. 261.

Trapezia cymodoce, *Miers, Ann. & Mag. Nat. Hist.* 1878, 5th ser. vol. ii. p. 409.

Trapezia cymodoce, *de Man, Notes from the Leyden Museum,* vol. ii. p. 177.

Two specimens were collected, one at Elphinstone Island and one at King Island.

Trapezia cymodoce has been collected in the Red Sea (Gulf of Suez, Djeddah), at Ceylon, in the Malayan Archipelago (Amboina, Manipa, Xulla-Bessy), the Philippine Islands, and finally on the coasts of New Caledonia, Australasia, the Fiji Islands, and the Marquesas group.

Family PORTUNIDÆ.

Genus NEPTUNUS, *de Haan.*

46. NEPTUNUS PELAGICUS, *Linné.*

Cancer pelagicus, *Linné, Mus. Lud. Ulr.* p. 434.

Portunus pelagicus, *Fabricius, Suppl. Entom. Syst.* p. 367.

Lupa pelagica, *H. Milne-Edwards, Hist. Nat. Crustacés,* t. i. p. 450.

Neptunus pelagicus, *Alph. Milne-Edwards, Etudes Zoolog. sur les Portuniens récents, in Archives du Muséum d'Histoire Naturelle,* 1861, t. x. p. 320.

A single young male specimen was collected at Elphinstone Island.

Neptunus pelagicus is distributed throughout the whole Indo-Pacific region from the Red Sea and Zanzibar as far as Tahiti.

47. NEPTUNUS GLADIATOR, *Fabr.*

Portunus gladiator, *Fabricius, Suppl. Entom.* p. 368.

Lupa gladiator, *Milne-Edwards, Hist. Nat. Crustacés,* t. i. p. 456.

Amphitrite gladiator, *de Haan*, '*Fauna Japonica, Crust.* p. 39, pl. i. fig. 5.
Neptunus gladiator, *Alph. Milne-Edwards, l. c.* p. 330.

Two very young male specimens in the Collection I refer with some hesitation to *N. gladiator*.

In the larger specimen, collected in the Mergui Archipelago, the distance between the tips of the epibranchial spines measures only 19 millim., the cephalothorax being 10¼ millim. long. The other, still younger individual was found at Owen Island.

Neptunus gladiator, Fabr., *N. argentatus*, White, *N. medius*, Stimps., and *N. gracilimanus*, Stimps., are most closely allied species of a section distinguished by the posterior margin of the arms of the cholipedes being bispinose. These species inhabit the same seas, and I think some of them may hereafter prove to be identical. *N. gladiator* may easily be distinguished from the others by the spine with which the upper margin of the orbits is armed. In the Mergui specimens, however, I do not observe this spine, but the external angle of the median lobe of the supraorbital margin only projects a little angularly forward: I suppose that this characteristic spine does not occur in very young specimens. In other respects they entirely agree with *N. gladiator*. The two median frontal teeth are distinctly developed; they are, however, much smaller and narrower than the next, but project equally forward. *Neptunus argentatus*, according to Prof. A. Milne-Edwards, differs by the carapace being comparatively less enlarged, by the absence of the supraorbital spine, and by the median frontal teeth being rudimentary. Young individuals of these species doubtless closely resemble young specimens of *Achelous granulatus*.

48. NEPTUNUS (HELLENUS) ANDERSONI, n. sp. (Pl. IV. figs. 3 & 4.)

One adult female specimen, bearing eggs, was collected at Elphinstone Island.

This remarkable little *Neptunus* belongs to the subgenus *Hellenus*, in which Prof. A. Milne-Edwards grouped those species which have the posterior angles of the cephalothorax acute and often armed with a short spine (A. Milne-Edwards, "Études sur les Crustacés Podophthalmiens," pts. v. and vi., in 'Mission Scientifique au Mexique,' Recherches Zoolog. iii. partie, p. 210, 1879). This species also presents some affinities to the genus *Xiphonectes* of the same author, which I am inclined to regard at most as only a subgenus of *Neptunus*. Hitherto four species of the subgenus *Hellenus* and three of *Xiphonectes* were known as inhabitants of the Indo-Malayan seas.

Neptunus Andersoni in its outer form and physiognomy appears closely allied to *Neptunus* (*Hellenus*) *rugosus*, A. Milne-Edw., from Australia; but it is distinguished by the arms of the chelipedes not bearing one but two spines It also greatly resembles *Neptunus* (*Hellenus*) *hastatoides*; but *N. Andersoni* presents a much broader frontorbital margin in proportion to the length of the carapace, and the arms of the chelipedes project less beyond the antero-lateral margins of the cephalothorax than in that species.

The upper surface of the carapace appears extremely uneven, as in *N. rugosus*, for it is not only very much embossed, but many lobules even rise into more or less developed, slightly granulated tubercles. Two slightly elevated tubercles are found on each protogastric lobe, and a somewhat larger tubercle is placed on the mesogastric lobe; behind the latter, two tubercles are observed on the cardiac region, placed in a transverse line close together, and more elevated than all the others. A single median tubercle occupies the middle of the intestinal region, and finally some other tubercles are placed symmetrically on the postero-lateral regions of the carapace. The whole surface is, moreover, covered with a short dense down, which, however, does not conceal the tubercles.

As in *N. rugosus*, the frontorbital or anterior margin of the carapace is comparatively very broad in proportion to the length, the latter being nearly as long as the distance between the external orbital angles. Unfortunately the left half of the frontal margin of our specimen is a little mutilated, so that I cannot describe exactly the form of the median tooth or teeth of the front; for, as in *N. rugosus*, a single small median tooth may perhaps also be found in this species in the middle of the front, or there may be two very small teeth. In every case the median tooth or teeth are much smaller and project much less forward than the next teeth; the latter are triangular, a little acute, and project about as much forward as the epistome, but not so much as the internal lobe of the under orbital margin. These teeth are separated by a rather deep emargination from the small, obtuse, external angles of the front (internal orbital angles), which project still less forward than the median tooth.

Immediately behind the external angles of the front, the smooth upper orbital margin presents a small short oblique crest and more outward two fissures; the external angle of the median lobe, situated between these two fissures, projects a little forward, though not forming a tooth. The under margin of the very large orbits also presents a fissure, and appears minutely denticulate between the latter and the large rounded internal lobe, which projects even more forward than the frontal teeth.

Whilst the left antero-lateral margin of the carapace is provided with nine teeth, the right presents only four between the external orbital angle and the terminal spine; these teeth evidently successively appear during the growth. The terminal spines are comparatively nearly as long as in *Nept. rugosus*, measuring about one third of the length of the cephalothorax; they are directed transversely outward and slightly forward, whereas in *N. rugosus* their direction is backward. The lateral angles of the posterior margin terminate each in a short acute spinule, directed outward and upward. The subhepatic regions of the carapace are a little hairy, and are fringed along the antero-lateral margins with longer hairs.

As regards the shape of the female abdomen, I refer to the figure of *Neptunus gladiator* published by de Haan (Fauna Japonica, pl. i. fig. 5), which wholly agrees with that of this species.

The somewhat hairy anterior legs are comparatively as short as in *Nept. rugosus*, and the arms extend but little beyond the antero-lateral margins of the carapace, and do not reach to the point of the great terminal spine. The anterior margin of the arms bears three acute, somewhat curved spines, the median one of which is found exactly on the middle of the margin; the proximal spine is seen immediately behind the median spine, but the distance of the distal spine from the latter is somewhat greater. The posterior margin of the arms is provided with two spines, a larger spine at the distal end and a somewhat shorter one close behind it. The wrist is armed at its internal angle with a large acute spine, and a smaller one is found on the middle of its posterior margin. The hand is armed with two spines, one on the outer margin of the upper surface, close to the articulation with the wrist, the second a little beyond the middle of the internal margin. A small dentiform tubercle, moreover, is found at the distal end of the outer margin, above the articulation of the mobile finger. The outer surface of the hands presents two longitudinal ridges or costæ, and the rounded under margin is a little transversely rugose. The hands are unequal in size, the right being the larger. In both the immobile finger is a little shorter than the under margin of the palm. The fingers are costate and sulcate on their surface, and the tips are a little curved; the mobile finger of the larger chelipede is armed with a very strong tooth, directed obliquely backward at the base, and with some smaller teeth; and the index finger presents three broad, strongly depressed teeth at the base opposite to the strong basal tooth of the mobile finger, and seven much smaller unequal teeth, which gradually diminish in size towards the tip. On the index of the smaller hand these three depressed basal teeth are not found.

The ambulatory legs are closely similar to those of *Nept. rugosus*, except the last pair, which agree most with those of *Nept. hastatoides* (de Haan, Fauna Japon. pl. i. fig. 3). The meropodites are almost as long as broad, but the penultimate joint or propodite is much longer than broad, being similar to the propodite of *Nept. hastatoides*, according to the figure in the 'Fauna Japonica.' In *Nept. rugosus*, on the contrary, the meropodite is longer than broad, and the propodite is comparatively less elongate. Also the terminal joint is a little more elongate than in *N. rugosus*, agreeing in this respect more with *Nept. hastatoides*.

Dimensions of the specimen described :—

	millim.
Distance between the internal angles of the front	5¾
Distance between the external orbital angles....	13¾
Distance between the tips of the terminal spines of the antero-lateral margins	31
Distance between the acute lateral angles of the posterior margin	9½
Length of the carapace (the front included)	14
Length of the under margin of the larger hand..	14

Genus THALAMITA, *Latr.*

49. THALAMITA SAVIGNYI, *A. Milne-Edw.*

Thalamita admete, *Audouin, Egypte, Crustacés par Savigny*, pl. iv. fig. 4.

Thalamita Savignyi, *Alph. Milne-Edwards, Archives du Muséum Hist. Nat.* 1861, t. x. p. 357; *de Man, Notes from the Leyden Museum*, vol. ii. p. 180.

Seven rather young specimens (6♂, 1♀) were collected at Owen Island, the largest of which is 27 millim. broad and 16 millim. long.

It is very difficult to distinguish young specimens of this species from the young of the closely allied *Thalamita admete*, Herbst, as the principal characters by which they are distinguished from one another appear successively during growth. One of the chief characters is the more pronounced granulation of the carapace and of the chelipedes. The largest specimen already presents many characters proper to *Thal. Savignyi*, though not all. The upper surface of the cephalothorax is hairy, and the minutely granulated transverse lines are very prominent. The outer surface of the wrist of the anterior legs is armed with three spines (two in *T. admete*) and with elevated lines, between which it is hairy and granular. The outer surface of the hands bears two granulated crests, and between the lower crest and the upper margin the surface appears already granular and hairy; the rounded under margin of the hands is equally granular. The whole inner surface of the hands, on the contrary, and the elevated ridge near the lower margin, which proceeds along the immobile finger, are smooth, as in *T. admete*.

In the younger individuals this granulation is still less pronounced, so that it becomes very difficult to distinguish them from *Thal. admete*.

I may finally add that a young female, the cephalothorax of which is only 15½ millim. broad, is already provided with eggs. *Thal. Savignyi*, however, attains a breadth of 40 millim.

Thalamita Savignyi was first discovered in the Red Sea, but has since been recorded from New Caledonia by Milne-Edwards; the species has evidently a wide distribution. According to Heller, *Thal. admete* occurs at the Nicobar Islands.

50. THALAMITA INTEGRA, *Dana*.

Thalamita integra, *Dana, United States Explor. Expedition, Crustacea*, part i. p. 281, pl. xvii. fig. 6; *Alph. Milne-Edwards, l. c.* p. 358.

One young male was found at Elphinstone Island. This specimen, the carapace of which is only 15½ millim. broad and 10 millim. long, wholly agrees with the description published by Alph. Milne-Edwards.

Thalamita integra has been recorded from many islands of the Pacific Ocean by Dana, and from Mozambique by Hilgendorf.

The Leyden Museum contains specimens from the shores of Amboina and Timor.

51. THALAMITA SIMA, *M.-Edw.*

Thalamita sima, *Milne-Edwards, Hist. Nat. Crust.* t. i. p. 460.

Portunus (Thalamita) arcuatus, *de Haan, Fauna Japonica, Crust.* p. 43, pl. ii. fig. 2, and pl. xiii. fig. 1.

Thalamita sima, *Alph. Milne-Edwards, l. c.* p. 359.

Two very young individuals were collected at Owen Island. They closely resemble the two species of the genus *Thalamonyx* described by Prof. A. Milne-Edwards under the names of *Thalamonyx Danæ* and *T. gracilipes*; but in *Thalamita sima* the two median frontal lobes are less prominent, and the carapace is comparatively more enlarged. I think, however, the genus *Thalamonyx* may ultimately prove to be identical with *Thalamita*, so that it would be better to refer the two foregoing species to the latter genus.

Thalamita sima has been observed on the coasts of Coromandel, Java, Amboina, New Caledonia, China, and Japan. Its occurrence in the Red Sea is still doubtful, because it is probably represented there by the closely allied *Thalamita Poissoni*, Aud., which I have proved to be a distinct species (Notes from the Leyden Museum, vol. ii. p. 181).

52. THALAMITA PRYMNA, *Herbst.* (Pl. IV. figs. 5 & 6.)

Cancer prymna, *Herbst, op. cit.* pl. lvii. fig. 2.

Thalamita prymna, *Milne-Edwards, Hist. Nat. Crustacés,* t. i. p. 461.

Portunus (Thalamita) prymna, *de Haan, Fauna Japonica, Crustacea,* p. 43, pl. xii. fig. 2.

Thalamita prymna, *Alph. Milne-Edwards, l. c.* p. 360.

Seven specimens of different size were collected—three at Elphinstone Island, one at Owen Island, and three at King Island.

The largest specimen is a male, and its carapace is 53 millim. broad; the cephalothorax of an ova-bearing female is only 30 millim. broad.

In all these specimens the fourth antero-lateral tooth of the carapace is rudimentary. They present, however, some differences which are probably individual. Thus the upper surface of the cephalothorax and of the legs in the specimens from King Island is densely covered with short hairs, as in *Thalamita Danæ*; whereas these hairs are nearly wholly absent in the other individuals. In most examples the ridge on the basal joint of the outer antennæ is provided with a row of very short, small spines; in some specimens, however, as in the largest male from Elphinstone Island, these spines coalesce into a denticulated laminiform crest, such as that described by Stimpson in the Japanese *Thalamita picta*; but in other individuals again this ridge is only armed with some acute granules of unequal size.

As the internal lobes of the upper orbital margin (outer frontal lobes) have probably a constant form in each species, it may be possible by them to distinguish the different species of this difficult genus. Thus these lobes are nearly straight in *Thalamita Danæ*, Stimps., but somewhat arcuate in *T. prymna.*

In all these specimens, even in the small individuals from King Island and in the very young male from Elphinstone Island, the outer surface of the hand is armed with a granulated crest between the elevated ridge, near the inferior margin, which runs on to the immobile finger and the spines of the upper surface. They thus differ in this character from the Red-Sea individuals described by me some time ago under the name of *Thalamita prymna* (Notes from the Leyden Museum, vol. ii. 1880, p. 180); for in the latter the crest does not occur, when they are less than 45 millim. broad, but only gradually begins to appear when they have attained that size. The Mergui specimens and those from the Red Sea, therefore, are either varieties of one species, or they belong to different forms. In the latter case, I propose to distinguish the Red-Sea specimens as *Thalamita picta*, a species still very imperfectly known and insufficiently characterized. One character mentioned as distinctive between these two forms, viz. the occurrence of an acute prominent crest on the basal joint of the external antennæ, occurs sometimes in specimens of *Thal. prymna*, as I have described above.

Thalamita prymna is found in the Indian Ocean and the Malayan Archipelago (Padang, Timor, Halmahera). It has also been recorded from the coast of New Caledonia, the Loo-Choo Islands, and Japan.

The occurrence in the Red Sea of the typical *T. prymna*, as now characterized, is a little doubtful.

53. THALAMITA SPINIMANA, *Dana*. (Pl. IV. fig. 7.)

Thalamita spinimana, *Dana, United States Expl. Exp., Crust.* part i.

p. 283, pl. xvii. fig. 8; *Alph. Milne-Edwards, Archives du Muséum Hist. Nat.* 1861, t. x. p. 364, and *Nouv. Arch. du Muséum Hist. Nat.* 1873, t. ix. p. 165, pl. iv. fig. 5.

One female specimen was collected at Elphinstone Island.

The distance between the points of the third antero-lateral teeth, which we may call the breadth of the carapace, measures 61 millim., and the carapace is 39 millim. long. When comparing this specimen with the individuals described above as *Thal. prymna*, I observed the following differences:—The frontal lobes are more prominent in *T. spinimana*, and are separated from one another by much longer and broader fissures, and the internal lobes of the upper orbital margin are still more arcuated. The median frontal lobes are nearly quadrangular, the second tooth is a little broader and separated from the median by a fissure which appears shorter (less deep) than that by which the two median teeth are separated from one another. The third frontal tooth extends a little more forward than the others, and is also a little narrower; the outer frontal lobes (the internal lobes of the upper orbital margin) are still more arcuate and curved than those of *Thal. prymna.*

The ridge on the basal joint of the outer antennæ is armed with three or four black-pointed acute spines, of which the two internal are united at their base; they are partially seen between the internal arcuate lobes of the upper orbital margin and the third frontal tooth. The five antero-lateral teeth of the carapace are nearly equal and successively decrease in length, so that the fourth tooth is a little shorter than the third, but still slightly longer than the fifth.

The chelipedes are armed with more spines than those of *Thalamita prymna.* The anterior margin of the arms presents five spines, of which the proximal and distal ones are, however, very small. The wrist bears a strong acute spine at its internal angle, and the outer surface is armed with six spines of different sizes. The subequal hands are comparatively less high, and therefore appear more slender than in *Thal. prymna*; they are armed with eight or nine spines, arranged in two rows on the upper margin, and the outer surface presents the same longitudinal granulated crest which is found in the Mergui specimens of *T. prymna*, but which is absent in individuals from near Djedda in the Red Sea, which I propose to refer to *Thal. picta.* Between this crest and the upper margin the outer surface of the hands is covered with some acute granules and spinules.'

The posterior margin of the penultimate joint of the natatory legs is provided with some short teeth, as in *T. prymna*. Kossmann is doubtless wrong in uniting into a single species all *Thalamitæ* with eight frontal lobes; but some species, however, may prove to be mere varieties of others.

As regards the figure of *Thal. spinimana*, published by Prof. A. Milne-Edwards, I may observe that the strange form of the front of this specimen is, without doubt, abnormal, similar abnormalities having been found by me also in other species of this genus.

Thalamita spinimana has been recorded from the Fiji Islands and from New Caledonia, the closely allied and probably identical *Thal. cæruleipes* having been found by the 'Novara' Expedition at the Nicobar Islands.

54. THALAMITA DANÆ, *Stimps.* (Pl. IV. figs. 8 & 9)

Thalamita crenata, *Dana, Unit. States Expl. Exp.* I. p. 282, pl. xvii. fig. 7.

Thalamita Danæ, *Stimpson, l. c.* p. 37 (1858); *Alph. Milne-Edwards, Archives du Muséum Hist. Nat.* 1861, t. x. p. 366, pl xxx. fig. 1.

Thalamita Stimpsoni, *Alph. Milne-Edwards, l. c.* p. 362, pl. xxxv. fig. 4.

Six specimens (2 ♂, 4 ♀) were collected—three at Owen Island, two at Elphinstone Island, and one at King Island.

Thalamita Danæ is, without doubt, a distinct species, distinguished by many constant and important characters. The internal lobes of the upper orbital margin are very depressed and nearly straight, differing much, therefore, from those of *T. prymna* and *T. spinimana*. The ridge on the basal joint of the outer antennæ is armed with a row of granules, which are never spinulose. The foregoing specimens wholly agree with the description and the figure published by Prof. A. Milne-Edwards. The upper surface of the carapace and of the legs is densely covered with short hairs. In most of the specimens the antero-lateral teeth are nearly equal, the fourth and the fifth being, however, a little smaller than the anterior. The fourth tooth in this species, however, appears to have a somewhat variable length, as has already been mentioned by Mr. Miers (Ann & Mag. Nat. Hist. 5th ser. vol. v. 1880, p. 288), so I conclude that *Thal. Stimpsoni*, A. M.-Edw., is a variety of *Thal. Danæ*, differing only from it in the rudimentary

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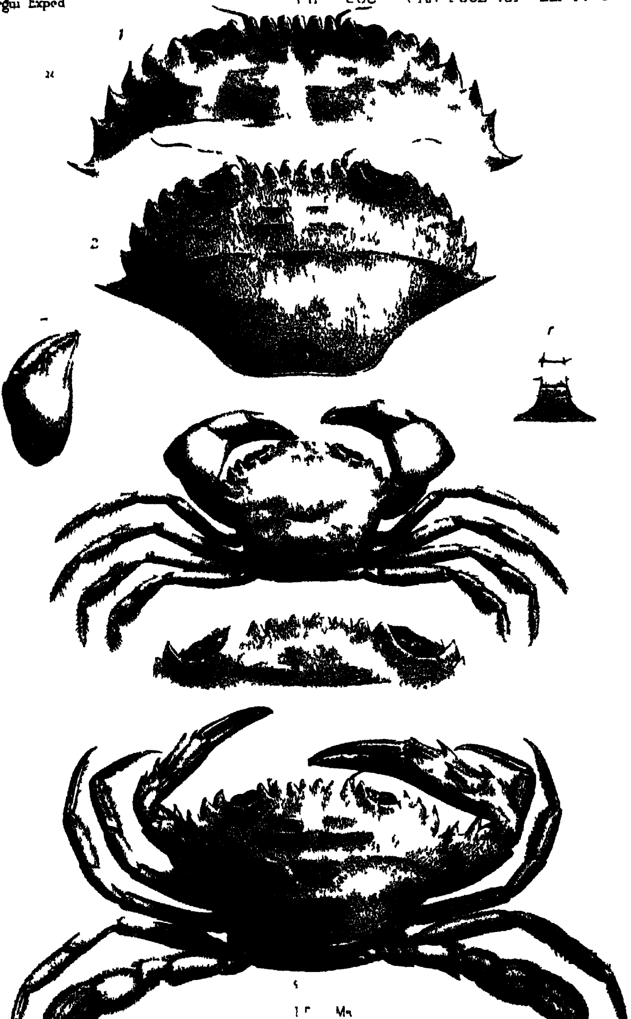

1 GONIOSOMA CRUCIFERUM G AFFINE 3 4 G MERGUIENSE

state of the fourth antero-lateral tooth, but entirely agreeing in all other characters.

The shape of the male abdomen is also characteristic of *T. Danæ*.

The Leyden Museum contains specimens of *Thalamita Danæ* from Amboina, Waigiou, Timor, Ceram, and Padang; and it has also been recorded from Auckland by Heller, from Hongkong and Java by Stimpson and Milne-Edwards, and from Mozambique by Hilgendorf.

55. THALAMITA CRENATA, *Latr.*

Portunus crenatus, *Latreille, Collection du Muséum.*

Thalamita crenata, *Ruppell, Krabben des Rothen Meeres,* 1830, p. 6, Taf i. fig. 2; *Milne-Edwards, Hist. Nat. des Crustacés,* p 461; *Stimpson, l. c.* p. 37; *Alph. Milne-Edwards, Archives du Muséum Hist. Nat.* 1861, t. x. p. 365, and *Nouv. Arch. du Muséum Hist. Nat.* 1873, t. ix. p. 166; *Hilgendorf, Monatsber. k. Akad d. Wiss. Berlin,* 1878, p 800.

One male specimen was collected at King Island.

The distance between the last antero-lateral teeth measures 60 millim. *Thalamita crenata* is sharply defined and distinguished from the preceding species by the absence of longitudinal crests and granulations on the outer and inner surfaces of the hands, which are very convex and nearly wholly smooth. As regards the shape of the cephalothorax, and more especially the shape of the frontal lobes, these two species, however, almost completely agree with one another.

Thalamita crenata is represented in the Leyden Museum by specimens from the Red Sea, from the island of Nossy-Faly, near Madagascar, from the Moluccas, Banda, Waigiou, Timor, and Macassar; also by specimens from the shores of Padang, Sumatra.

This species is, moreover, recorded from the coasts of China, the Loo-Choo Islands, Pondicherry, Java, the Nicobar Islands, and Mozambique. It seems, therefore, to be distributed throughout the whole Indo-Pacific Region from the Red Sea and Mozambique as far as the shores of China and the Marquesas group.

Genus GONIOSOMA, *Alph. M.-Edw.*

56. GONIOSOMA CRUCIFERUM, *Fabr.* (Pl. V. fig. 1.)

Portunus crucifer, *Fabricius, Suppl. Entom. Syst.* p. 364.

Thalamita crucifera, *Milne-Edwards, Hist. Nat. Crustacés,* i. p. 462.

Goniosoma cruciferum, *Alph. Milne-Edwards, Archives du Muséum Hist. Nat.* 1861, t. x. p. 371.

One male specimen was collected in the Mergui Archipelago. The distance between the points of the last antero-lateral teeth measures 71 millim., and the cephalothorax is 45 millim. long. The last antero-lateral tooth is directed transversely outward. I may also add that the posterior margin of the penultimate joint of the natatory legs bears two minute teeth.

Goniosoma cruciferum is found in the Indian Ocean, the Malayan Archipelago, and in the Chinese and Japanese seas, having been collected at Bombay, Pondicherry, Singapore, Sumatra, Java, Amboina, Port Jackson, the Philippines, Hongkong, and Japan.

57. GONIOSOMA AFFINE, *Dana*. (Pl. V. fig. 2.)

Charybdis affinis, *Dana, United States Expl. Exped., Crust.* part i. p. 286, pl. xvii. fig. 12.

Goniosoma affine, *Alph. Milne-Edwards, Archives du Muséum Hist. Nat.* 1861, t. x. p. 384.

Two fine adult specimens were collected in the Mergui Archipelago, a male and a somewhat larger ova-bearing female.

This species is still little known and very rare. As no examples are to be found in the large collections of the Leyden Museum, the following remarks may be desirable.

As Dana observes, this species is very similar to *Goniosoma cruciferum*, Fabr.; I will therefore compare it with the specimen of the latter which is in the collection.

The cephalothorax of the male is 23¼ millim. long and 37 millim. broad, that of the female is 26½ millim. long and 43 millim. broad; the proportion of the breadth and the length of the carapace is therefore in this species quite equal to the same proportion in *G. cruciferum*. As regards the structure of the upper surface of the cephalothorax, both species agree very well with one another; but the antero-lateral regions are more depressed and even a little concave in *G. affine*. The whole upper surface is covered with a close down of very short hairs, and marked with the same minutely granulated transverse lines which are found in *G. cruciferum*.

The frontal teeth also closely resemble those of the latter species, but still more so those of *G. quadrimaculatum* (A. Milne-Edwards, *op. cit.* pl. xxxiv. fig. 8); they are scarcely acute, much depressed, and the two median teeth are most prominent. The second teeth are directed somewhat obliquely outwards and separated from the third, which extends straight forwards, by a fissure deeper and longer than that by which the first and the second teeth are separated. The fourth teeth, or internal angles of the upper orbital margin, are directed somewhat obliquely outwards.

The first antero-lateral tooth has a very characteristic form; it is truncated and slightly excavated at its external margin, as in *G. cruciferum*, but it projects much more forwards than in that species, as will be seen by a comparison of figs 1 & 2 Pl. V.; the second tooth is about the same size as the first, but is never larger than it, and it is rather acute, although without a dark point. The four posterior teeth are dark-pointed and acute; the third, fourth, and fifth teeth are directed straight forwards, but the last transversely outwards and slightly forwards. The last tooth is also a little longer than the anterior ones. Like the frontal teeth, those also of the antero-lateral margins are much depressed and flattened. The postero-lateral regions resemble those of *G. cruciferum*, and are concave.

The shape and the size of the internal lobe of the lower orbital margin are also characteristic of this species; for this lobe projects a little more forwards than the internal lobe of the upper margin of the orbits, while in *G. cruciferum* the latter projects more forwards than the former.

The subhepatic regions are hairy.

The anterior legs are quite similar to those of *G. cruciferum*, in the relative length of the arms and chelæ and in their form and armature. The anterior margin of the arms presents three spines; the wrist is armed with a long spine at the internal angle, and with three small acute spines at the outer surface. The outer surface of the hands of *G. affine* presents two longitudinal minutely granulated crests near the smooth convex under margin, and between the upper margin and the ridge which is continued upon the immobile finger; in *G. cruciferum* only one crest is found on this place. The external surface of the hand of *G. affine* has therefore three, whilst that of *G. cruciferum* has only two, longitudinal crests. The outer and upper surfaces of the hands of *G. affine* are covered with short hairs; whereas in this specimen of *G. cruciferum* these surfaces are perfectly glabrous and smooth. The upper surface is armed with five spines, two along the inner margin (viz. one in the middle and one above the articulation of the mobile finger), and three along the external margin, viz. one at the articulation with the wrist, a second a little beyond the middle, and the third above the articulation of the mobile finger. The shape, structure, and armature of the fingers are quite similar in both species.

The ambulatory and the natatory legs wholly resemble those of *G. cruciferum*, and consequently the meropodites of the natatory legs are very broad and sulcate, the proportion of their length and breadth being as 6 : 4, and the grooves on their upper (outer) surface are hairy. The penultimate joint presents the same elongated form, and its posterior margin has only traces of two or three minute teeth. As regards the shape of the male abdomen, both species perfectly agree with one another.

G. affine may therefore be distinguished from *G. cruciferum* (1) by its smaller size, (2) by the different shape and form of the first antero-lateral tooth, (3) by the internal suborbital lobe being much more prominent, (4) by the presence of three longitudinal crests on the outer surface of the hands.

Young specimens of *G. cruciferum* have, however, still to be examined in order to ascertain whether they present the same characters as the adult.

G. affine, Dana, is a rare species, which has hitherto been recorded only from the seas of Singapore.

Besides the well-known *G. cruciferum*, Fabr., and *G. natator*, Herbst, there is still a fourth species of *Goniosoma*, in which the first antero-lateral tooth of the carapace is truncated and slightly excavated, namely, *G. miles*, de Haan, from the Japanese seas. This species, however, differs from *G. affine* (1) in its larger size, (2) by its narrower cephalothorax, (3) by its more acute frontal teeth, and especially (4) by its more elongated anterior legs, the merus-joints of which are armed with four strong teeth anteriorly, and by its hands having their outer and under surfaces covered with minute granules and squamose granular lines.

58. GONIOSOMA MERGUIENSE, n. sp. (Pl. V. figs. 3 & 4.)

? Synon.: Goniosoma spiniferum, *Miers, Report on the Zoological Collections made in the Indo-Pacific Ocean during the Voyage of H.M.S. 'Alert,'* 1884, p. 233; pl. xxiii. fig. C.

A thorough revision of the genus *Goniosoma* is much needed, not only because the typical specimens of Fabricius and Herbst have never been examined by later carcinologists, but also because the numerous species are often only distinguished by very slight differences. I therefore consulted Prof. Milne-Edwards regarding this species, and I was informed by him that it is closely allied to *G. quadrimaculatum*, A. M.-Edw.* It differs, however, from *G. quadrimaculatum* (1) by the form of the antero-lateral teeth, the last of which is distinctly longer than the preceding, not only in young specimens but even in the adult; and (2) by the carpopodites of the natatory legs being armed with an acute spine, and by other characters.

This species is probably identical with *G. spiniferum*, Miers, from North-eastern Australia, which was, without doubt, established upon a young specimen. In the latter the outer surface of the carpopodites of the anterior legs is armed with only two spinules, and the posterior margin of the penultimate joint of the natatory legs is not denticulated; whereas in equally young specimens, and indeed in all the twenty specimens of the Mergui form, there are three spinules, and denticulations are distinctly present. I therefore prefer to describe the Mergui crab as a new species, but a renewed examination of the species from Port Molle may perhaps prove its identity with *G. merguiense*.

I may further add that, according to Milne-Edwards, *G. acutum* from Japan is a distinct species.

The Collection contains a fine series of twenty specimens of various sizes of the new species, nine of which were found at

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* A close examination of the typical specimen of Fabricius's *Portunus lucifer* (Suppl. Entom. p. 364) led me to the conclusion that it is identical with *Goniosoma quadrimaculatum*, A. M.-Edw. I also received from Prof. Mobius the type specimen of Fabricius's *Portunus annulatus*, which is much smaller than the type of *P. lucifer*. I am much inclined to regard *P. annulatus* as only a younger specimen of *P. lucifer*, for I scarcely find any other differences than that the cephalothorax of the latter is a little more enlarged than in the former, and that the antero-lateral spines and those of the anterior legs are less acute than in *P. annulatus*, characters which probably may be due to the greater age of the type of *P. lucifer*. The carpopodite of the natatory legs in *P. lucifer*, as in *P. annulatus*, is quite unarmed, but the propodite is denticulated along its posterior margin. In both species the last antero-lateral tooth is the smallest.

I may further add that an examination of the typical specimen of the *Goniosoma* described by Heller as *G. orientale* (Novara Reise, p. 29, t. iii. fig. 3), has proved it to be identical with *P. annulatus*, Fabr. The fine violet rings on the legs are still visible, almost as distinctly as in the dried specimen described by Fabricius. *G. Hellerii*, A. M.-Edw. (1867), is probably a different form.

King Island Bay, and five at Elphinstone Island; but the exact localities of the others are not recorded. The largest specimen is 63 millim. broad, the smallest only 11 millim.; and the others are of intermediate size.

In its general outer appearance this species resembles closely *G quadrimaculatum*, A. M.-Edw., = *G. luciferum*, Fabr., the cephalothorax being considerably enlarged. In the largest specimen, which is 63 millim. broad, the distance between the tips of the last antero-lateral teeth is in proportion to the length of the cephalothorax as 21 : 13. The rather depressed upper surface of the cephalothorax appears minutely punctate when it is examined under a lens; and it is covered with a short pubescence, especially anteriorly and on the antero-lateral regions, but in many specimens this is worn off, as *e. g.* in the largest individual. The upper surface is marked anteriorly with the usual minutely granulated, slightly prominent, transverse lines. The posterior line which unites the last antero-lateral teeth with one another has a somewhat sinuous course, and it is interrupted, on each side of the mesogastric area, by the scarcely distinct gastrobranchial groove; before this line the middle of the protogastric region is marked with another non-interrupted transverse line, which is as broad as the front; and before this line two pairs of transverse lines are found on the epigastric area, the anterior pair being very small. No transverse lines are found behind the long line which unites the two last antero-lateral teeth.

The front, *i. e.* the distance between the internal orbital angles, measures precisely a third of the distance between the tips of the last antero-lateral teeth. The large series of individuals in the Collection has enabled me to observe a remarkable fact, namely, that the frontal teeth are blunt and rounded in very young specimens, that they successively appear more pointed in older ones, and that they are finally more or less acute and sharp in adult individuals. Thus in the smallest specimen of the Collection, only 11 millim. broad, the two first or median teeth are blunt, rounded, and separated from one another by a minute incision; the second, somewhat broader, teeth are also broadly rounded, slightly directed outwards, and separated from the first by a small triangular hiatus; the third teeth are straight, also blunt, though narrower than the first, and separated from the second by a narrow, though somewhat longer fissure; the fourth frontal teeth or internal orbital angles are triangular, and also rather obtuse. In specimens which are twice as large and 22 millim. broad, the frontal teeth still fully resemble those of the youngest specimen. In larger individuals the frontal teeth appear gradually less rounded, more triangular, and pointed, and separated from one another by larger and deeper fissures, though the two median teeth are changing their form a little more slowly than the others, appearing obtuse, whereas the other teeth are already pointed and acute. In a specimen 50 millim. broad the two median teeth are blunt, the second teeth triangular, though still obtuse; the third and the fourth teeth, however, are very acute, especially the third. In the largest specimen in the Collection, which is 63 millim. broad, all the frontal teeth are sharp and acute, those of the first pair being even triangular and a little pointed. The frontal teeth are flattened and depressed, and the median teeth are slightly more prominent than the others. The front appears to me to be a little more prominent than in *G. spiniferum*; but as the figure of that species is a double enlargement made from a young and small specimen, the drawing is perhaps somewhat inexact.

The orbits are of the usual size, and their upper margin presents two narrow linear fissures; the internal lobe of the inferior margin of the orbits is triangular and acute, and projects scarcely as much forwards as the internal angle of the upper margin. The inferior orbital margin is also marked with a fissure or hiatus.

The antero-lateral margins are armed with six acute teeth, including the external orbital angles; the tips of all the teeth are dark-coloured. The first two teeth are of equal size; the third is a little larger, as in *G. annulatum*, Fabr.; the fourth is a little smaller than the third; the fifth is a little smaller than the fourth; and the sixth or last tooth is distinctly longer than the preceding, being directed transversely outwards and slightly forwards*. In the younger specimens the last antero-lateral tooth is almost twice as long as the fifth, while in the largest specimen it is still distinctly longer than the fifth. The postero-lateral margins are rather concave.

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* Though the first two antero-lateral teeth are slightly smaller than the third in this species, as in *G. annulatum*, Fabr., *G. luciferum*, Fabr., and *G. japonicum*, de Haan, they are, however, about as large as the fifth; in *G. orientale*, Dana=*dubium*, Hoffm., and in *G. acutifrons*, de Man, on the contrary, the second antero-lateral tooth is rudimentary, being in the last-mentioned species even scarcely perceptible.

The external antennæ are long, and measure two thirds of the length of the cephalothorax; their basal joint is armed with a minutely granulated, rounded, and little prominent crest. In *G. acutum*, A. M.-Edw., a species inhabiting the Japanese seas, and closely allied to our species, this crest is armed with two spines.

The sternum and the abdomen are minutely punctate, but are quite smooth and glabrous. In its general shape the male abdomen resembles that of *G. quadrimaculatum* (Archives du Muséum, tom. x. pl. xxxiv. fig. 3 *a*). The terminal joint is triangular and equilateral; the length of the penultimate joint is scarcely shorter than the breadth of its posterior margin, and the lateral margins of this joint are a little rounded and convex on their anterior half. In *G. luciferum* = *G. quadrimaculatum* the penultimate joint is a little shorter, and it therefore appears slightly more enlarged. As usual, the lateral margins of the female abdomen are fringed with hairs.

The anterior legs are rather short, extending with their distal half beyond the lateral margins. The anterior margin is armed with four spines, including a small spinule at the distal end (in the larger chelipede of the largest specimen, a fifth accessory spine is found between the two proximal spines, but this spine is certainly an abnormality). In many specimens, a small spinule is found at the distal end of the under margin inserted on the tuberculiform prominence which is there seen. The rounded posterior margin is slightly granular, but the rest of the arms is smooth. The wrist is armed with a long strong spine at its internal angle, and with three acute spinules on its outer surface; the ridges on the outer surface, terminating in these spinules, are minutely granular.

The hands are comparatively less swollen than those of *G. annulatum*. As regards the proportion of the length of the fingers to that of the palm, both species agree with one another. The larger hand of the largest specimen is scarcely more than three times as long as it is high at the base of the fingers; the smaller hand is comparatively lower, and appears therefore slightly more elongated. The upper surface is armed with five spines arranged, as usual, in two rows; two are found on the internal margin, and three in the external row, the proximal of the latter being found at the articulation with the wrist. The distal spines are situated above the articulation of the mobile finger. The outer surface of the hands presents three longitudinal parallel ridges, one below and near the under margin, and continued upon the immobile finger, the second on the middle of the outer surface, and the third, proceeding parallel to the second, from the proximal spine of the external row of the upper margin up to the middle of the palm. In the adult specimen these ridges are smooth, in the younger individuals often minutely granular. The outer surface of the palm, its convex under surface, and the inner surface, which also presents a more or less distinctly indicated longitudinal ridge on the middle, are smooth; but the upper surface of the palm is minutely granular; the dorsal ridges on the upper surface, which terminate in the spines, are also somewhat granular. On the hand of the smaller chelipede of the adult specimen these granules are less distinct The fingers are similar to those of *G. annulatum*, Fabr.

The three succeeding pairs of legs are a little more slender than those of *G. annulatum*, Fabr., the joints being slightly more elongated. Thus the propodites of the legs of the third, or middle, pair are thrice as long as broad; in *G. annulatum*, however, they are scarcely more than twice. The dactylopodites are also more slender.

The natatory legs are similar to those of *G. luciferum* = *G. quadrimaculatum*. The merus-joint is about twice as long as broad, slightly longitudinally grooved near the anterior and again near the posterior margin, which is armed near the distal end with a strong spine. The carpopodite is armed, as in *G. spiniferum*, Miers, at the posterior margin of its under surface with an acute backwardly directed spine. The penultimate joint or propodite in all the specimens is denticulated along its posterior margin, having 7–9 acute spinules. The flattened terminal joint has a small spinule at its distal extremity.

Like the cephalothorax, the legs are also covered with a close pubescence, while the more prominent parts, such as the ridges and spines, are glabrous; in many examples, however, this pubescence has been worn off.

Dimensions of the largest specimen :—

	millim.
Length of the cephalothorax (without the abdomen).	39
Distance between the external orbital angles......	36½
Distance between the tips of the last antero-lateral teeth, being the breadth of the cephalothorax ..	63
Distance between the tips of the external frontal teeth, *i. e.* between the internal orbital angles = breadth of the front	21
Length of the penultimate joint of the male abdomen.	5⅖
Breadth of the posterior margin of this joint......	6
Length of the larger hand (the fingers included) ..	44½
Length of the fingers..........................	21
Height of the hand at the base of the fingers......	14

A female of a species of *Goniosoma* from Amboina, preserved in the Leyden Museum, and referred by me some years ago to *G. annulatum*, Fabr., agrees completely with the Mergui specimens, except that the last antero-lateral tooth is only as long as the fifth and not longer. I regard this form as a local variety.

G. luciferum, Fabr. = *G. quadrimaculatum*, A. M.-Edw., *G. annulatum*, Fabr., and *G. japonicum*, de Haan, are all closely allied to *G. merguiense*. They may be distinguished from it at first sight by the absence of the spine on the carpopodite of the natatory legs. In *G. japonicum* the long crests of the hands are always distinctly granular; the penultimate joint of the male abdomen is differently formed; the penultimate joint of the natatory legs is unarmed; the meropodites of the natatory legs are more enlarged; and the last antero-lateral tooth is the smallest of all.

Subtribe *Catometopa.*

Genus EUCRATE, *de Haan.*

Mr. Miers supposes that the genera *Pseudorhombila*, M.-Edw., *Carcinoplax*, M.-Edw., *Eucrate*, de Haan, and *Pilumnoplax*, Stimps., will prove to be identical, when they come to be submitted to a thorough revision. In my opinion, however, the genus *Eucrate*, de Haan, must be retained; for this genus is a very natural one, distinguished not only by its entire physiognomy, but also by the structure of the external antennæ. In the genus *Eucrate* the internal orbital hiatus is occupied by a process at the base of the antennæ, so that the flagellum is quite excluded from the orbital cavity. In the genus *Carcinoplax*, on the contrary, at least in the two species which I have studied, viz. *C. setosus* and *C. integer*, the internal orbital hiatus is occupied by the base of the antennæ itself, as in *Pilumnus*, so that the flagellum is not excluded from the orbits. According to the descriptions of Milne-Edwards and Stimpson, the genera *Pseudorhombila* and *Pilumnoplax* seem to agree with *Carcinoplax* in the flagella of their external antennæ not being excluded from the orbits; whereas the genus *Heteroplax*, Stimps., agrees with *Eucrate* in the character of its external antennæ.

59. EUCRATE AFFINIS, *Haswell*. (Pl. V. figs. 5–7.)

Eucrate affinis, *Haswell, Catalogue of the Australian Stalk- and Sessile-eyed Crustacea*, 1882, p. 86.

? Pilumnoplax sulcatifrons, *Stimpson, Proc. Acad. Nat. Scienc. Philadelphia*, 1858, p. 93.

Four fine specimens (three ♂, one ♀) of a crustacean collected at King Island Bay, I refer, although with some hesitation, to the rare species *E. affinis*, Haswell. These specimens not only belong to the genus *Eucrate*, de Haan, but in many characters even present a striking resemblance to the typical representative of this genus, *E. crenata* from Japan. Besides their smaller size, they may be distinguished from the latter species by the more depressed cephalothorax, and by the ridge-like elevations with which the upper surface is covered.

I refer these specimens to Haswell's *E. affinis* from the Australian coast, although his description of it does not completely agree with them. Thus Haswell does not describe the anterior margin of the front as being transversely sulcated; and according to the same author, the wrist is very hairy externally, whereas in the Mergui specimens it is only hairy anteriorly towards and near the articulation with the hand. In Haswell's specimens, also, the hands presented a longitudinal ridge close to the inferior border; but in the Mergui specimens an impressed longitudinal line is found only on the outer surface of the immobile finger close to the inferior border, the palm being quite smooth.

The following is a full description of the four specimens. The cephalothorax closely resembles that of *E. crenata*, the proportion of the breadth and the length being precisely the same; but it is a little less convex, and the antero-lateral margins are comparatively a little longer than in the Japanese species. In the form and the structure of the front and of the orbits, both species are alike. The front is slightly declivous, straight, and divided by a small median triangular notch into two truncated lobes; the anterior margin is distinctly transversely sulcated, and the two lobes are a little prominent in the middle; so that the front is perfectly similar to that of *E. crenata*. The internal angle of the upper orbital margin is described by Haswell as being acute; but in our specimens it resembles *E. crenata* only when the carapace is viewed from above; when, however, the front orbital region is looked at anteriorly, the internal orbital angle appears obtuse, though transversely carinated. As in *Heteroplax*, the internal orbital hiatus is occupied by a process of the base of the antennæ, so that the flagellum is excluded from the orbital cavity; the flagellum therefore appears in the hiatus between the internal orbital angle and the front, when the carapace is looked at from above. The flagellum is a little longer than half the length of the cephalothorax. The upper margin of the somewhat oblique orbits presents two fissures, one about the middle, and the other near the external angle; the inferior orbital margin also presents a small hiatus near the external orbital angle. The internal lobe of the infraorbital margin is dentiform, and projects a little more forwards than the internal angle of the upper margin. It is separated by a small emargination from a second, though smaller and less prominent lobe of the infraorbital margin, situated on its interior half.

The antero-lateral margins are much shorter than the postero-lateral, and are armed with four teeth, including the external orbital angle. These teeth are rather acute and nearly equal, the third being, however, a little longer and slightly more prominent than the others, and the fourth being the smallest of all; they are all more or less distinctly carinate above. The antero-lateral margins are little oblique, so that the carapace is rather narrow. The external elevated margin of the last antero-lateral tooth extends backwards for a short distance, thus constituting the postero-lateral margin; but it soon disappears, so that the postero-lateral margin becomes undefined. A little more inwards, however, on each side of the upper surface of the carapace, a ridge-like, longitudinal, somewhat rugose elevation is found, running obliquely forwards from the posterior margin of the cephalothorax, and parallel to the postero-lateral margin, almost to the level of the last antero-lateral tooth.

A little behind the frontal margin two slight transverse elevated lines are observed on the upper surface of the cephalothorax between the orbits; these epigastric ridges are separated from one another by a faint mesial frontal furrow, which is bifurcated behind as usual. Two other transverse ridge-like elevations are found on each antero-lateral region, the anterior of which is situated at the base of the third antero-lateral tooth; whereas the posterior, parallel to the anterior, is found at the base of the fourth antero-lateral tooth. The anterior of these transverse ridges and the transverse epigastric ridges are united on each side by a ridge-like elevation which runs parallel to the upper orbital margin. The cervical suture which separates the gastric from the cardiac region is very faintly marked. An impressed line proceeds close to and parallel to the posterior margin of the cephalothorax. The rest of the upper surface of the cephalothorax appears quite smooth and glabrous, slightly convex anteriorly and flattened posteriorly.

In *Eucrate affinis* the endostome is more distinctly longitudinally ridged on each side than in *E. crenata*, but in the form of the epistome and of the anterior margin of the buccal cavity, both species resemble one another. The male abdomen is seven-jointed, scarcely narrower towards the base than the contiguous part of the sternum; the third joint is the most enlarged; and the remaining terminal part is very narrow, the joints gradually increasing in length and decreasing in breadth, so that the terminal joint is the longest of all. I have only a female specimen of *E. crenata* before me, and I am therefore unable to decide whether both species agree with one another as regards the form of the male abdomen; but the female abdomen presents precisely the same form in both species.

The anterior legs are subequal, the right being in all the specimens a little larger than the left; they have the same form and size both in the male and in the female. The anterior as well as the ambulatory legs are closely similar to those of *E. crenata*.

The upper margin of the arms is armed with a strong tooth near its distal end, which is "separated distally by a transverse groove from a second, lower, transverse elevation," as Haswell rightly observes. The wrist, armed with a small tooth at its internal angle, is smooth and glabrous on its convex upper surface, except towards the distal and anterior margin. especially towards that part which lies between the internal tooth and the articulation of the hand, where it is densely hairy. In *E. crenata* a larger portion of the upper surface is hairy; and in Haswell's specimens of *E. affinis* the wrist is described as being very hairy externally; so I suppose the *whole* outer surface in them was hairy. The hands are quite smooth, convex, and glabrous, and closely resemble those of *E. crenata*; the fingers are nearly as long as the palm, and are also smooth, the mobile finger presenting a longitudinal punctated line on its outer surface, whereas the index is marked with a longitudinal impressed line on the outer surface close to the inferior border. The inner surface of the palm is also convex and almost glabrous, being only a little hairy near the articulation with the wrist. The fingers have pointed crossed tips, and their inner margins are denticulate, the mobile finger presenting two somewhat stronger teeth at the base, whereas the index is armed with some stronger teeth at the middle of its inner margin. The ambulatory legs are closely similar to those of *E. crenata*, the first three pairs being nearly equally long, whereas the last pair is shorter. The three terminal joints are slightly hairy along their anterior and posterior margins. The dactylopodites are depressed, and, like the propodites, they are longitudinally sulcate on their upper surface. The dactylopodites of the last pair are slightly curved upward towards their extremity, and are a little shorter than the propodites, being similar to those of *E. crenata*.

Dimensions:—

	♂. millim.	♀. millim.
Length of the cephalothorax..........	11¼	12½
Breadth of the cephalothorax (distance between the third antero-lateral teeth).	14½	16

Eucrate affinis, Haswell, has been recorded from the Australian coast (Port Denison), where it was collected in 20 fathoms.

Pilumnoplax sulcatifrons, Stimps., is closely allied, or perhaps even identical, with this species. Indeed, when comparing these specimens with the description given by the American naturalist, I was struck by the great conformity between them.

Stimpson, however, says in his description that the antennæ are similar to those of *Pilumnus*; but perhaps he has mistaken their real structure, as his specimens were very small. The species lately described and figured by Miers under the name of *Pseudorhombila sulcatifrons*, var. *australiensis*, is also closely allied to this species; but it seems to differ by its longer and more slender dactylopodites, by the non-emarginate front, and the complete absence of hairs on the wrist (Miers, Zoology of the Voyage of H.M.S. 'Alert,' Crustacea, p. 242, pl. xxiv. fig. C).

Should *Pilumnoplax sulcatifrons*, Stimps., prove to be identical with *Eucrate affinis*, Hasw., I should then be inclined to retain the latter name, although of later date than the former, because in both species the anterior margin of the front is transversely sulcate.

Genus CARCINOPLAX, *M.-Edw.*

60. CARCINOPLAX SETOSUS, *A. M.-Edw.*

Carcinoplax setosus, *Alph. Milne-Edwards, Nouv. Arch. du Muséum Hist. Nat.* t. ix. p. 267, pl. xii. fig. 2.

Three specimens (one ♂, two ♀) were collected at Owen Island.

The cephalothorax of the largest individual is 7½ millim. broad.

This small species has been found on the shores of New Caledonia and of the island of Banda (*Leyden Museum*).

61. CARCINOPLAX INTEGER, *Miers.*

Carcinoplax integra, *Miers, Report on the Zoological Collections made in the Indo-Pacific Ocean during the Voyage of H.M.S. 'Alert,'* 1884, p. 543, pl. xlviii. fig. C.

Three specimens were collected at Elphinstone Island, two males and one female.

I am enabled to add some additional remarks to Miers's description of this species, as the Mergui specimens are of a much larger size than those he described. The cephalothorax of the largest specimen (♂) is 10¼ millim. broad and 7¾ millim. long; unfortunately this specimen has lost both chelipedes. The specimen which was described by Miers was only half that size. The front is much deflexed, and divided by a small median triangular incision into two lobes; the margins of these lobes are nearly straight being only very faintly emarginate towards their lateral angles, *i.e.* the internal orbital angles; in *Carcinoplax setosus* they are more distinctly separated from the latter by a small lateral cleft. The inferior margin of the orbits presents a trace of a fissure or a very indistinct hiatus close to their external angle. As in *C. setosus*, the endostome is faintly ridged; but in so young a specimen as that which was collected by H.M.S. 'Alert' the ridges might easily be overlooked. The merus-joint of the external maxillipeds has been very well figured by Mr. Miers, but inexactly described; the anterior half of the internal margin is slightly excavated, and the antero-external angle is rounded.

The male abdomen presents seven distinct joints, and the penultimate joint is a little broader than long. The fingers have pointed, crossing, naked tips, and are slightly longitudinally sulcate. I may observe that the dactylopodites of the last pair of ambulatory legs are slightly curved upward towards their corneous claw, both in this species and in *C. setosus*, the same way as in the genus *Pilumnoplax*.

Carcinoplax integer has hitherto been recorded only from the Seychelles.

Genus Telphusa, *Latr.*

62. Telphusa Stoliczkana, *Wood-Mason.*

(Compared with the typical specimens of *Telphusa indica*, Latr., and *T. Larnaudii*, A. M.-Edw.)

Telphusa Stoliczkana, *Wood-Mason, On Indian and Malayan Telphusidæ, Journ. Asiatic Society of Bengal*, vol. xl. pt. 2, 1871, p. 199, pl. xii. figs. 8–12.

The Collection contains a fine series of nine specimens, five of which were collected at Thaing, and four at Yimıki, both in King Island.

This species has been very well described and figured by Mr. Wood-Mason, so that I have little to add. It may easily be recognized by the enlarged and depressed cephalothorax, the rather shallow cervical suture, the straight non-interrupted postfrontal crest which unites the two more or less prominent epibranchial teeth with one another, and by the somewhat granulated front, the anterior margin of which is deeply emarginate.

Prof. Alph. Milne-Edwards kindly compared for me a specimen, which I had sent to him, with the typical specimens of Latreille's *T. indica*, which is closely allied to this species. According to Prof. Milne-Edwards, *T. Stoliczkana* differs from *T. indica* by the more dilated branchial regions, by the less profound gastro-branchial groove, by the more sharply defined protogastric (epigastric) lobes, and by the deeply emarginate frontal margin, which in *T. indica* is entire.

T. Stoliczkana is also allied to *T. Larnaudii*, Alph. Milne-Edw., a species which not only inhabits Siam but also the island of Sumatra, as I indicated some years ago in my Note on the Crustacea collected by the Dutch Sumatra Expedition (de Man, Crustacea, in P. J. Veth's 'Midden-Sumatra,' Leiden, 1880, iv. pt. xi. p. 2, pl. i.). Prof. Milne-Edwards having sent me a typical specimen of *T. Larnaudii* from Siam, I am enabled to describe the characters by which this species may be distinguished from *T. Stoliczkana*. In *T. Larnaudii* the epibranchial teeth are situated closer to the external orbital angles, so that the distance between the epibranchial teeth and the external orbital angles is comparatively shorter. It is in consequence of this difference that both species present an entirely different outer appearance. The front is more granular in *T. Larnaudii*, and less profoundly emarginate; the postfrontal crest, of which at least the external portions are straight and entire in *T. Stoliczkana*, proceeding continuously and uninterruptedly to the epibranchial teeth, is in *T. Larnaudii* much more interrupted not only in its inner or epigastric, but also in its external portions, which are not prolonged in an uninterrupted line to the epibranchial teeth. In my figure of the Sumatran *T. Larnaudii* this latter character has unfortunately not been correctly represented. In *T. Larnaudii* the antero-lateral and epigastric regions are more transversely rugose, and the inflected subhepatic and pterygostomian regions, which are smooth or nearly smooth in *T. Stoliczkana*, are covered in the former with numerous oblique and transverse rugose lines.

The largest specimen of *T. Stoliczkana* in the Collection, a male, is 52 millim. broad and 39 millim. long (the abdomen not included), the proportion of the length to the breadth being as 3 : 4, the same as in Wood-Mason's typical specimens.

T. Stoliczkana was discovered at Penang, and is a species proper to the islands which are situated near the western coast of the Malayan peninsula.

63. **TELPHUSA CALLIANIRA**, n. sp. (Pl. VI. figs. 1–3.)

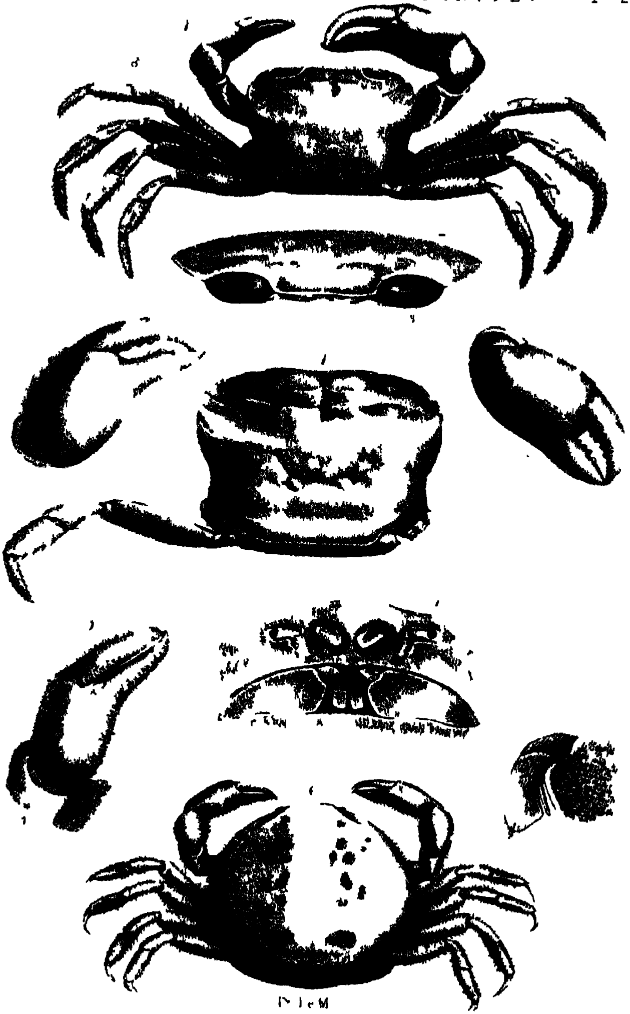
(Compared with the type specimen of *Telphusa grapsoides*, White, and with the type specimens of *T. hydrodromus*, Herbst, *T. Jagori*, v. Mart., and *T. subquadrata*, Gerst., which are preserved respectively in the British Museum and in the Museum at Berlin.)

Fifteen specimens (eight ♂, seven ♀) of this pretty little *Telphusa* are in the Collection; thirteen of which were collected in the mangrove-swamps of Kisseraing Island, the two others in Sullivan Island.

This new species is closely allied to the previous species, and, I presume, also to *T. angustifrons*, A. M.-Edw., a species inhabiting Cape York. It belongs to the group in which the postfrontal ridge is interrupted not only in the middle by the median frontal furrow, but also on each side of the latter in the middle, and again near the lateral margins; so that the two median portions are more advanced than, and wholly separated from, the lateral, which do not reach the epibranchial tooth.

The cephalothorax is rather narrow, though broader than long. The proportion of the distance between the epibranchial teeth to the length of the cephalothorax (the abdomen being excluded) is about 16 : 14, both in the male and in the female. The cephalothorax presents its maximum of breadth immediately behind the epibranchial teeth; so that the anterior half of the lateral margins is slightly convex outwards and the posterior faintly concave. The upper surface of the carapace is rather depressed and flattened; anteriorly it is somewhat convex, and the front is almost vertically deflexed downwards. In the female the upper surface is a little more convex.

The front is of moderate breadth; the breadth of its anterior margin is in proportion to the distance of the epibranchial teeth almost as 6 to 16, so that the front measures a little more than a third of the distance of the epibranchial teeth. The anterior margin of the front, which is nearly straight, presents only a very slight median sinus, and is almost at a right angle with the upper margins of the orbits. In *T. hydrodromus*, Herbst, however (a species inhabiting the island of Ceylon, and closely allied to our *T. Callianira*), these angles are very oblique and rounded, according to Dr. Hilgendorf, who kindly compared for me this species with all the *Telphusæ* of the Zoological Museum of Berlin. Dr. Hilgendorf



1-3 [illegible] HUSIA CALLIANIRA 4-5 [illegible] CARINIFERA

6-9 PINNOTHERES [illegible] WARDSI

informed me then that the Mergui *Telphusa* was not represented in the Museum*.

The upper surface of the cephalothorax is minutely punctate. The front is somewhat granular between the orbits. Besides the median frontal furrow, which divides as usual the postfrontal ridge, and the arcuate median portion of the cervical suture, which separates the gastric from the cardiac region, no other interregional grooves are found on the upper surface; nevertheless on each side of the gastric region the upper surface is somewhat impressed in an oblique direction, from the epibranchial tooth towards the mesogastric region; by these impressions the gastric region is separated from the epibranchial portions of the upper surface. The branchial regions are hardly at all inflated. The postfrontal ridge is distinctly indicated and interrupted, not only by the median frontal furrow, but also at each side of the latter, in the middle, and near the lateral margins. The two median or internal portions, which are somewhat transversely rugose anteriorly, and which are separated from one another by the median frontal furrow, are a little more advanced than the lateral portions, from which they are completely separated. These lateral ridges are scarcely broader than the median, and are nearly straight and directed towards the epibranchial teeth, whereas the median portions are slightly arcuate. The lateral portions, however, are not continued as far as the epibranchial teeth, but are interrupted at some distance from them. Immediately behind that interruption, on each side of the upper surface, a short oblique rugose line is observed. The orbital margins are smooth and entire; the flattened external angles of the orbits are nearly right angles, and are therefore scarcely acute. The external margin of the cephalothorax, between the external angle of the orbits and the epibranchial tooth, is smooth and entire. The epibranchial tooth is acute and prominent; and the lateral margins of the cephalothorax behind it are marked with many oblique piliferous lines. I may further add that the gastric region appears sometimes minutely rugose, immediately behind the postfrontal ridge, when examined under a lens. The convex pterygostomian regions are slightly granular, and the inflected sides of the cephalothorax are marked with some oblique elevated lines. The outer surface of the ischium-joint of the external maxillipeds presents an impressed longitudinal line, to which Mr. Hilgendorf first directed attention as a character serving to distinguish the species of this genus. In *T. Callianira* this line is situated about the middle of the joint, and is directed a little obliquely, so that it almost coincides with a diagonal uniting the internal angle of the anterior margin of the joint with the external angle of the posterior margin. The outer surface of this joint is minutely punctate. In *T. hydrodromus* this impressed line is situated much closer to the internal margin of the joint.

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* Gerstacker and Hilgendorf suppose that *Telphusa hydrodromus*, Herbst, is identical with *T. grapsoides*, White. To me, however, the latter appears to be distinct from the former species. In *T. grapsoides* the distance between the epibranchial teeth is almost exactly the length of the cephalothorax, whereas in *T. hydrodromus* the breadth is in proportion to the length as 16 : 13.

The outer surface of the sternum and of the abdomen is faintly punctate. The male abdomen has a characteristic form. It gradually and rather rapidly narrows towards the posterior margin of the penultimate joint; the latter is nearly quadrate, and as long as broad at the posterior margin, its lateral margins being nearly straight. The terminal joint is distinctly longer than broad at its base; it is rounded at the tip, and the lateral margins are slightly concave immediately behind the middle of the joint, which therefore presents a characteristic form. In *T. hydrodromus* the penultimate joint is broader than long.

T. Callianira belongs to the small species of the genus; in the adult ova-bearing female specimen the distance between the epibranchial teeth measures only 15 millim.

The anterior legs are very unequal, especially in the male; and the larger chelipede is found either on the right or on the left side. The outer surface and the upper margin of the arm are somewhat transversely rugose, and the anterior margin is somewhat granular. The upper surface of the wrist is slightly rugose towards the external and internal margins; the latter is armed at the internal angle with an acute tooth. The larger hand is about as long (the fingers included) as the breadth of the cephalothorax, and twice as long as high (the fingers included). The palm itself is but little longer than high at the base of the fingers; its outer surface is convex, smooth, and slightly punctate, like the inner surface, and the upper and under margins are rounded. The lower finger is slightly deflexed, and the mobile finger is slightly arcuated, leaving a hiatus when closed; both fingers are feebly toothed, the teeth of the index being the larger. The mobile finger is nowhere longitudinally grooved, but appears minutely granular when examined under a lens; the index presents a slight longitudinal groove on its outer surface, and the pointed tips cross one another.

The smaller hand of the male measures only two thirds of the length of the larger hand, and the upper margin of the palm is a little granular or rugose. The fingers of the smaller hand are distinctly longer than the palm; and they meet along the whole length of their inner margins, and do not at all gape; they have pointed crossing tips; and both fingers are slightly longitudinally grooved, and appear minutely granular along these grooves. The inner margins are feebly toothed. I may observe that in the larger hand of young male specimens the fingers are less gaping and the palm appears slightly granular on its upper margin.

The anterior legs of the female are much smaller than those of the male, and are also somewhat unequal, although never differing so much from one another as do those of the male. The wrist presents a more rugose upper surface. The hands are similar to the smaller hand of the male as regards their outer appearance, the fingers being slightly longer than the palm and meeting along their whole inner margins The palm of the larger hand appears slightly granular on its outer surface, and the palms of both hands on their upper margins. The fingers have pointed tips, and are feebly denticulated along their inner margins, and in the fingers of the smaller hand of the male they are faintly longitudinally grooved and minutely granular along the margins of these grooves.

The ambulatory legs present the usual slender form, and are similar to those of *T. Stoliczkana* except that their dactylopodites, the outer and inner surfaces of which are quite smooth and plain, or scarcely convex, never present any traces of longitudinal grooves or ridges, and are, moreover, less tapered towards their tips, and therefore somewhat obtuse, as the spines with which their joints are armed are continued close to their tips.

Dimensions of the two largest specimens :—

	♂. millim.	♀. millim.
Length of the cephalothorax (the abdomen excluded)	13½	12⅕
Distance between the external orbital angles	12¾	12¼
Distance between the epibranchial teeth	15⅔	14¾
Breadth of the anterior margin of the front	5¾	5⅓
Length of the larger hand	16	9½
Height of the larger hand (at base of the fingers)	8	4⅕

Dr. Anderson kindly compared this species for me with the (single) type specimen of White's *Telphusa grapsoides* preserved in the British Museum. *Telphusa grapsoides* has a more square cephalothorax, the length of which is nearly equal to the distance between the epibranchial teeth, and the front is more prolonged forwards. The anterior or internal (median) portion of the post-frontal ridge is very feebly, if at all, marked in White's species, but the posterior or external portion presents the same form and direction in both species.

The dimensions of the type specimen of White's *T. grapsoides* are as follows :—

	♂. millim.
Length of the cephalothorax (abdomen excluded)	16
Distance between the external orbital angles	13½
Distance between the epibranchial teeth	16⅕
Breadth of the front	6

Telphusa grapsoides, which I have never seen, inhabits the Philippine Islands.

Telphusa lævis, Wood-Mason, from Central India, is also more or less similar to this species, but differs from it in its more enlarged cephalothorax, the different form of the abdomen of the male, &c.

64. **TELPHUSA CARINIFERA**, n. sp. (Pl. VI. figs. 4 & 5.)

The Collection contains a third species of the genus *Telphusa*, a single male specimen of which was collected in Elphinstone Island Bay.

Dr. Hilgendorf, who kindly compared it for me with the species of *Telphusæ* in the Zoological Museum of Berlin, informed me that it was not represented in that Museum. Though closely allied to *T. Callianira*, it is distinguished from it at first sight by the more enlarged front and, probably even from all other *Telphusæ*, by the remarkable structure of the postfrontal ridge.

The outer appearance of the cephalothorax is very similar to that of *Telphusa Callianira*, being rather narrow, although broader than long, and having the epibranchial regions scarcely if at all inflated. The proportion of the distance between the epibranchial teeth to the length of the cephalothorax (the abdomen not included) is as 16 : 13, so that the carapace is comparatively a little broader than that of *Telphusa Callianira*. The upper surface is rather depressed; anteriorly it is very declivous and the front is strongly deflexed. The proportion of the distance between the epibranchial teeth to the breadth of the anterior margin of the front is as 16 : 7½, so that the front is almost half as broad as the distance between the epibranchial teeth. The anterior margin of the front presents a wide but very shallow median sinus. As in the preceding species, the frontal margin forms a right angle with the upper margins of the orbits, and the upper surface of the front is somewhat granular. The upper surface of the carapace has nearly the same structure as that of *T. Callianira*. The postfrontal ridge is interrupted in the middle by the median frontal furrow, and again on each side at some distance from the epibranchial teeth; the two median (or internal) portions are therefore, as in the preceding species, more advanced than the lateral, from which they are completely separated. The anterior or median portions of the ridge, which occupy as usual the epigastric lobes, do not constitute a single ridge, but are composed of four or five smaller, parallel, rugose elevated lines. The lateral portions, however, are ridge-like and directed towards the epibranchial teeth; but are not continued so far, as they are interrupted at some distance from the lateral margins. As in *T. Callianira*, one or two rugose lines are observed immediately behind the interruption. This species therefore probably differs from all other *Telphusæ* by the occurrence of two accessory median ridges immediately behind the postfrontal ridge, *i. e.* at some distance behind the internal or median portions of the latter, one on each side of the median frontal furrow. These ridges are not continued behind the lateral portions of the postfrontal ridge. As in *T. Callianira*, the upper surface of the cephalothorax presents on each side a transverse, somewhat oblique impression behind the lateral portions of the postfrontal ridge; these impressions are bordered posteriorly on each side by a transverse elevated line, which proceeds from the external margin of the epibranchial tooth towards the mesogastric region. The orbital margins are smooth and entire. The external angles of the orbits are but little prominent, and the external margin of these angles appears smooth and entire. The epibranchial tooth is about as prominent as that of *T. Callianira.* Behind this tooth the lateral margins of the cephalothorax are marked with numerous, oblique, piliferous elevated lines. The posterior margin of the cephalothorax, which is somewhat concave in *T. Callianira*, is perfectly straight in this species.

The posterior half of the upper surface is somewhat punctate, and the gastric region is minutely rugose behind the six ridges or ridge-like elevations with which the cephalothorax is marked anteriorly. The pterygostomian regions and the inflected sides of the carapace are faintly rugose.

As regards the outer foot-jaws, the characteristic longitudinal impressed line, which in many species is found on the outer surface of the ischium-joint, is completely wanting in this species.

The male abdomen is triangular and less narrowed towards the terminal half than in *T. Callianira.* The lateral margins of the penultimate joint are somewhat converging towards the anterior margin of this joint, the posterior margin of which is much broader than long. The terminal segment, which is rounded at the tip, and the lateral margins of which are slightly concave, is about as long as broad at its base.

As the smaller chelipede is wanting, I can only describe the larger one. The arm and the wrist present the same structure as in *T. Callianira*; the hand also much resembles that of the preceding species, but the lower finger is not at all deflexed. The fingers are distinctly shorter than the palm, which has the outer and inner surfaces quite smooth and convex; the under margin of the palm is rounded and smooth, the upper margin is minutely granular. The mobile finger is slightly arcuated, gaping, and minutely granular above; both fingers are grooveless, the index scarcely presenting any trace of a longitudinal groove near the tip. In their denticulation the fingers wholly agree with those of *T. Callianira*, and the under margin of the lower finger is minutely granular near the tip.

The ambulatory legs are unfortunately wanting, except the left leg of the last pair; this leg closely resembles the corresponding leg of *T. Callianira*, but the propodite is comparatively a little shorter and broader. The dactylopodite is flattened and not grooved or ridged.

Dimensions:—

	millim.
Length of the cephalothorax	10⅜
Distance between the epibranchial teeth	13⅛
Distance between the external orbital angles....	11⅛
Length of the larger hand (fingers included)....	10½
Height of the hand	5¼
Breadth of the front	6⅛

Genus PINNOTHERES, *Latr.*

65. PINNOTHERES EDWARDSI, n. sp. (Pl. VI. figs. 6–9.)

The collection contains one adult female specimen of a *Pinnotheres*, provided with eggs, which was found in an *Ostrea* at King Island Bay.

I regard this species as new. So far as I know, eight species of the genus *Pinnotheres*, besides the European *P. pisum* (which, according to Heller, occurs also in New Zealand), have been described as inhabiting the shells of Mollusca in the Indian Ocean.

Although the specimen before me agrees in many of its characters with the European *P. pisum*, it appears to be distinguished from it by the shape of its external maxillipeds and by the short down with which the whole animal is nearly covered.

It closely resembles *P. pisum* in the shape of its cephalothorax, but the front is a little more prominent and the carapace is somewhat more laterally dilated, the antero-lateral portion of the lateral margin making a blunt angle with the postero-lateral portion. The upper surface is a little convex, and the grooves or depressions by which the gastric, cardiac, and intestinal regions are separated from the lateral regions of the upper surface are rather deep, whereas in *P. pisum* these impressions are quite indistinct.

The whole upper and under surfaces of the cephalothorax, the external maxillipeds and the abdomen included, appear to have been covered with a very short dense down, but it seems to have been rubbed off the prominent parts of the upper surface, as it is now found only in the grooves and depressions.

The shape of the external maxillipeds may be easily recognized by the figure. The merus-joint is much longer than broad and not simply rounded at the distal end. It appears rather quadrilateral, the arcuated outer and the concave inner margin having the same length and being much longer than the two other margins situated at the distal end; these margins make a nearly right angle with each other, and the anterior one, on which the palpus is inserted, is a little concave, the other somewhat arcuated. The palpus is rather large; its penultimate joint, which is nearly once and a half as long as the antepenultimate, has a characteristic form, being somewhat dilated towards the distal end, where it is obliquely truncated. The dactylopodite is rather short, and does not extend beyond the distal end of the penultimate joint.

The legs are quite similar to those of *P. pisum*, but they are a little shorter in proportion to the cephalothorax, and the joints are somewhat less slender. The chelipedes perfectly resemble those of *P. pisum*. The ambulatory legs have all nearly the same length; those of the third pair are not longer than the legs of the first and the second pair, and those of the fourth pair are not shorter than the legs of the third pair. The dactylopodites of the ambulatory legs have all the same length, being somewhat shorter than the propodites; they are a little arcuated, and each terminates in a very acute point.

The chelipedes and the other legs are covered with a short dense down, with interspersed longer hairs.

Dimensions:—

Breadth of the cephalothorax	16 millim.
Length of the cephalothorax	15 „
Length of the ambulatory legs	14 „

This species, with which I have much pleasure in associating the name of the eminent carcinologists of the Muséum du Jardin des Plantes, is evidently closely allied to *Pinnotheres Rouxi*, M.-Edw., and to *P. villosus*, Guér., from the Indian seas; but it differs from these in the shape of its maxillipeds, and from *P. Rouxi* moreover by the short down with which it is covered.

66. **Pinnotheres parvulus**, *Stimps.*

Pinnotheres parvulus, *Stimpson, Proceed. Acad. Natural Sciences Philadelphia,* 1858, p. 108.

The Collection contains three other specimens of a *Pinnotheres*, all provided with eggs, and found in *Pinna atropurpurea* and *P. vexillum*, from King Island Bay. I refer them to Stimpson's *Pinnotheres parvulus.*

This species closely resembles *P. globosus*, Hombr. & Jacq. (= *obesus*, Dana), in its outer appearance; but it is distinguished from it by the relative length of the ambulatory legs and of their joints. In *P. globosus* these appendages are very slender and successively decrease in length, those of the third, or penultimate pair, being a little shorter than those of the antepenultimate pair, and the fourth or last pair is the shortest of all. The dactylopodites of all the ambulatory legs have nearly the same length in Dana's figure.

In these specimens, on the contrary, the ambulatory legs of the first pair are the shortest of all, those of the second pair are but little longer; the legs of the third pair, however, are much longer than the two preceding pairs and are the longest of all, for the legs of the fourth pair, though distinctly longer than those of the first two pairs, are shorter than the legs of the penultimate pair. The meropodites of all the ambulatory legs have nearly the same length, except those of the third pair, which are once and a half as long as those of the other legs. The carpopodites of the legs of the third pair are almost twice as long as those of the first pair, and the carpopodites of the last pair are a little shorter than those of the first pair. The propodites also gradually increase in length from the first to the third pair, those of the latter being nearly twice as long as the propodites of the first pair of legs. The propodites of the fourth pair are nearly as long as the meropodites of the same legs, and a little shorter than the propodites of the penultimate pair.

The dactylopodites of the first two pairs are rather short, scarcely surpassing half the length of the propodites of these legs. Those of the third pair are distinctly longer, measuring about two thirds of the propodites of these legs. The dactylopodites of the last pair are very similar to those of *P. globosus*' (Milne-Edwards, Ann. Sci. Nat. t. xx. 1853, pl. xi. fig. 6 *a*), and are the longest of all the dactylopodites, being but little shorter than the propodites of these legs. The legs are somewhat hairy towards their extremities.

The external maxillipeds are quite similar to those of *P. globosus*.

The crabs above described are about 10 millim. broad.

Pinnotheres parvulus was discovered by Stimpson in shells of *Meroë quadrata* from the Chinese sea; and the Leyden Museum contains specimens found in shells of *Cytherea* from the coast of Padang, Sumatra.

Genus XANTHASIA, *White*.

67. XANTHASIA MURIGERA, *White*.

Xanthasia murigera, *White, Ann. & Mag. Nat. Hist.* 1st ser. vol. xviii 1846, p. 177, pl. ii fig. 3.

Xanthasia murigera, *Milne-Edwards, Ann. Sci. Nat.* t. xx. 1853, p. 221; *Alph. Milne-Edwards, Nouv. Arch. du Muséum Hist. Nat.* t. ix. p. 321.

The Collection contains two female specimens, the larger of which is provided with eggs, whereas the other is sterile; they were found in *Tridacna crocea*, Lam., at Owen's Island.

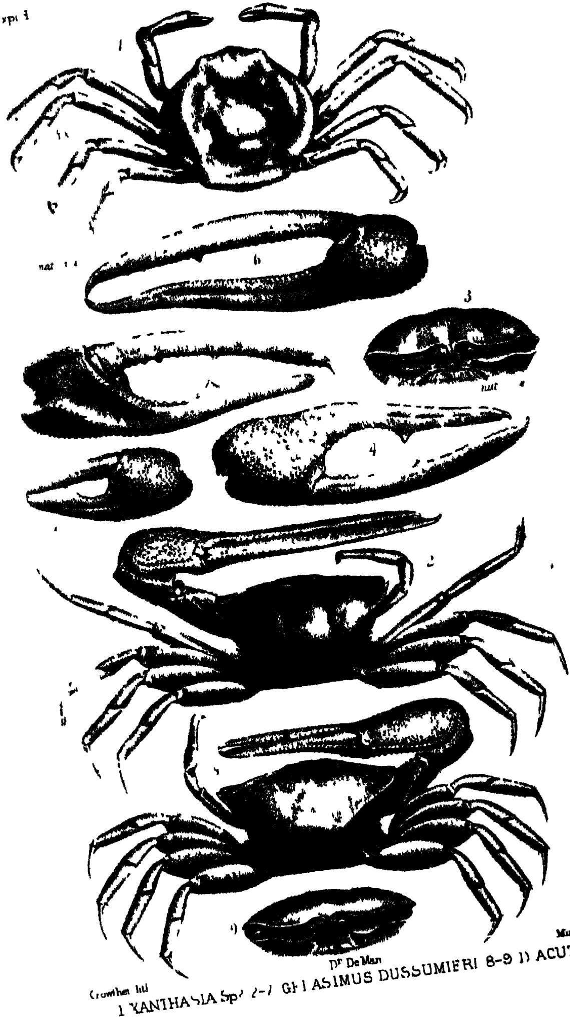
The cephalothorax of the larger specimen is 11 millim. broad and 10 millim long. In both specimens the lateral margins are elevated into a thin acute crest or ridge, which, as White rightly describes, is curled round, on each side, behind the lateral knob, on the front of the carapace. In the smaller specimen both lateral margins are continuous, passing into one another at the posterior margin of the cephalothorax; but in the larger specimen they do not pass into one another, the posterior margin being interrupted, though only by a narrow space, in the middle. The front, the upper surface of the elevated prominence on the middle of the carapace, and the outer surface of the posterior margin of the latter, are minutely and irregularly granular. The female abdomen, which bulges extremely, is coarsely and irregularly punctate, but the wide rounded keel which it presents in the middle is smooth.

Xanthasia murigera has been recorded from the Philippine and Fiji Islands, and from New Caledonia.

68. XANTHASIA, sp. (Pl. VII. fig. 1.)

The Collection also contains two other specimens of this genus, found in the mantle-cavity of a *Tridacna gigas* in Elphinstone Island Bay. As the upper surface of the cephalothorax of these

Mergui Exped



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1 XANTHASIA Sp? 2-7 GELASIMUS DUSSUMIERI 8-9 G ACUTUS

crabs presents a somewhat different appearance from the cephalothorax of *X. murigera*, I am inclined to regard them as a distinct species. They differ from it in the following characters:—The crests or ridges are rather rounded and not thin or acute, and the anterior curls are indistinct or quite absent; they also pass into the raised, broad, and nearly straight, posterior margin, which projects much more backwards than in *X. murigera*, and forms a right angle with the lateral margins. The length of the carapace in these specimens therefore measures more than the distance between the raised lateral margins.

The legs also are more elongated and more slender than in typical representatives of *X. murigera*, all the joints presenting this character, especially the hands and the meropodites, carpopodites, and propodites of the ambulatory legs.

The integument not being strong and solid, but rather pliant and similar to parchment, I am inclined to regard the different shape of the carapace as an individual variety. I do not venture to decide this question, but, as the legs are also more slender and more elongate than those of *Xanthasia murigera*, these specimens may perhaps prove to represent a distinct species, for which I would propose the name of *Xanthasia Whitei*.

Dimensions of the larger ova-bearing specimen:—

Length of the cephalothorax.................	14	millim.
Distance between the raised lateral margins ..	12½	,,
Length of the legs of the antepenultimate pair	22	,,
Length of the hands, the fingers included	7	,,

Genus OCYPODA, *Fabr.*

69. OCYPODA CERATOPHTHALMA, *Pallas.*

Cancer ceratophthalmus, *Pallas, Spicil. Zool.* fasc. ix. p. 83, pl. v. fig. 17 (1772).

Ocypoda ceratophthalma, *Fabricius, Suppl. Entom. Syst.* p. 347; *Milne-Edwards, Hist. Nat. des Crustacés*, t. ii. p. 48, and *Ann. Sci. Nat.* 3e série, t. xviii. p. 141.

Ocypoda ceratophthalma, *de Man, Notes from the Leyden Museum*, vol. iii. 1881, p 245.

Ocypoda ceratophthalma, *Miers, Ann. & Mag. Nat. Hist.* 5th ser. vol. x. 1882, p. 379.

Twenty specimens of this common Indian species were collected, all being very young, except one nearly adult female.

Sixteen specimens were collected at Sullivan Island, and four at Owen Island.

All belong to that variety in which the epibranchial angles of the lateral margins of the carapace project nearly equally, or scarcely more outwardly than the external orbital angles.

Ocypoda ceratophthalma has been recorded from Port Natal, Madagascar, Mauritius, Malayan Archipelago, Torres Strait, Celebes, Philippines, New South Wales, the Fiji, Samoa, and Sandwich Islands, from Japan and the Chinese Sea (Amoy).

70. OCYPODA CORDIMANA, *Latr.*

Ocypoda cordimana, *Latreille, Milne-Edwards, Hist. Nat. des Crust.* t. ii. p. 45, and *Ann. Sci. Nat.* t. xviii. p. 143; *Alph. Milne-Edwards, Nouv. Arch. du Muséum Hist. Nat.* t. ix. p. 271.

Ocypoda cordimana, *de Man, Notes from the Leyden Museum,* vol. iii. 1881, p. 248.

Ocypoda cordimana, *Miers, Ann. & Mag. Nat. Hist.* 5th ser. vol. x. 1882, p. 387.

Nec Ocypoda cordimana, *de Haan, Fauna Japonica, Crustacea,* p. 57, tab. xv. fig. 4.

Nine specimens (7 ♂, 2 ♀) were collected at Sullivan Island, two of which were found in fresh water.

Ocypoda cordimana has been collected at Mauritius, the Seychelles, Ceylon, the Malayan Archipelago (Java, Borneo, Xulla-Bessy, Sanghir), New Caledonia, New Hebrides, the Fiji Islands, and China (Amoy).

Genus GELASIMUS, *Latr.*

71. GELASIMUS DUSSUMIERI, *M.-Edw.* (Pl. VII. figs. 2–7.)

(Compared with a typical specimen from the Paris Museum.)

Gelasimus Dussumieri, *Milne-Edwards, Ann. Sci. Nat.,* 3e série, t. xviii. p. 148, pl. iv. fig. 12.

Gelasimus Dussumieri, *Hilgendorf, Reise von v. d. Decken in Ost-Africa, Crustaceen,* p. 84, Taf. iv. fig. 1; *Alph. Milne-Edwards, Nouv. Arch. du Muséum Hist. Nat.* t. ix. p. 274.

The Collection contains no fewer than fifty-seven fine and well-preserved specimens (30 ♂, 27 ♀) of this species, forty-two of which were collected in a freshwater stream in Kisseraing Island.

The following full description of this common Indian species is given, because it is still insufficiently known, and because the form presents some varieties, which it will be useful to record. The rich materials at my disposal have enabled me to study the slight variations which are presented by the cephalothorax and by the larger hand of the male; and I have compared them with a typical specimen of this species from the Paris Museum, so that my identification may be accepted as correct.

Gelasimus Dussumieri belongs to that section of the genus which is characterized by a narrow front between the eyes; but it may be distinguished from the other species of the section chiefly by the shape of its cephalothorax and by the form of the larger hand of the male,

The cephalothorax of the adult male (Pl. VII. fig. 2) has a smooth and bright upper surface, which is very arcuate and convex longitudinally, and for the shape of which I refer to my figure. The front, which has been well figured by Hilgendorf (*l. c.* fig. 1 *b*), is very narrow and constricted between the insertion of the eye-peduncles, and is again enlarged a little below at the rounded anterior margin, where it presents a minute, triangular, median incision. The median furrow extends a little beyond the middle of the front and is very narrow and linear; between the insertion of the eye-peduncles its breadth measures a little less than a third of that of the front, so that the raised margins, which border the furrow on each side, appear a little broader than the furrow itself, which is nearly equally broad along its whole length. In very young males, in which the distance between the external orbital angles measures 14 millim., the median frontal furrow is a little broader, so that its breadth somewhat surpasses that of the lateral margins. These raised lateral margins of the front pass laterally into the sinuated upper margin of the orbits. The latter is bordered below by an accessory line at a short distance from it, running parallel to the upper margin nearly from the spot where the thickened basal portions of the eye-peduncles pass into the slender stalk, near to the point where the latter passes into the cornea. The upper wall of the orbits therefore presents a long narrow stripe between the upper margin and that accessory line; this stripe appears a little broader in the female than in the male, the distance between the upper orbital margin and the accessory line, being a little shorter in the male than in the female.

The external orbital angles are very acute and directed obliquely forwards. In the adult male the antero-lateral margin * of the carapace makes a very obtuse angle with the postero-lateral, so that the former is easily distinguished from the latter, when the upper surface of the carapace is viewed from above, as in fig. 2. But at a somewhat younger age the postero-lateral margin often does not form an angle with the antero-lateral, so that in these individuals both margins form a single straight line which extends obliquely backward from the external orbital angle. The upper surface of the carapace therefore in these cases has a somewhat different shape, and a specimen presenting this character has been figured by Mr. Hilgendorf (Taf. iv. fig. 1). But in other males of the same size the carapace resembles that of the first described adult form. In the female, the lateral margin often appears minutely granular, but it is smooth in the male. In the adult male the postero-lateral margin becomes indistinct long before it reaches the posterior margin of the carapace, but in the female it remains visible for more than half its length. In consequence of this oblique course of the lateral margins, the carapace is much narrowed posteriorly and is broad in front. The inferior margin of the orbits is minutely crenulate, both in the male and in the female, except a small internal portion of it, about as long as the external antennæ, which is entire. This inferior orbital margin appears everywhere simple, and does not present even a trace of that accessory line which occurs very distinctly in *Gelasimus forceps*, M.-Edw. The pterygostomian regions are very convex, somewhat rugose, and covered with short hairs, both in the male and in the female.

The male abdomen closely resembles that of *Gelasimus arcuatus*, de Haan, the fifth joint being the longest of all, and the sixth being a little shorter than the fourth.

In its general appearance the larger chelipede of the male seems closely to resemble that of *Gelasimus arcuatus* of the 'Fauna Japonica.' The upper margin of the arm is a little granular, and the anterior margin is provided with some small, acute, unequal teeth at its distal end; the anterior and the external (or posterior) surfaces of the arm are also minutely granular.

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* The epibranchial angle is that point where the lateral margin of the cephalothorax is crossed by the oblique line which is found on the lateral surfaces of the carapace. The antero-lateral margin is the line between the external orbital angle and the epibranchial angle; and the postero-lateral margin is the rest of the lateral margin.

The upper rectangular surface of the carpopodite is covered with small granules, and its anterior margin is fringed with rather long hairs. The hand of the adult male is very large, and measures nearly twice the distance between the external orbital angles, but it never surpasses this length. The breadth of the palm measured in the middle between the upper and under margins amounts nearly to a third of the whole length of the hand, so that the fingers are about twice as long as the palm. Sometimes, however, the palm is comparatively shorter and the fingers are still more elongate, as represented in fig. 6. The slender fingers are strongly compressed laterally, and the index tapers regularly to the tip; but the mobile finger begins to taper only a little before the pointed hooked extremity. The inner margin of the immobile finger is armed with a tolerably strong tooth a little before the middle (fig. 4), but for the rest it is unarmed and terminates in an acute point, curved slightly upwards. The tooth of the immobile finger is occasionally little developed, and a similar hand has been figured by Milne-Edwards (*l. c.* pl. iv. fig. 12); and in the variety which I have figured in fig. 6 the index appears even wholly unarmed along its entire length. The inner margin of the thumb only is granular and it is never armed with a tooth; two somewhat prominent granules, however, are found on it, the proximal of which is situated near the articulation with the palm and the second immediately beyond the tooth of the lower finger. In the variety which I have figured (fig. 6) one of these two prominent granules is absent. The outer surface of the palm is everywhere rather coarsely granulated, and the upper margin bears two rows of granules. This granulation is continued along the upper margin of the thumb and the lower margin of the index, but disappears towards the extremities of the fingers, the inner margins of which are also granulated. Each finger presents an impressed line on its outer surface, running parallel to the inner margins.

The inner surface of the palm is minutely granular only between the two more coarsely granulated oblique crests with which it is provided, whilst the triangular under surface, between the inferior oblique crest and the under margin, is flattened and appears wholly smooth. The inner surface of the fingers also is wholly smooth and devoid of granulations. Sometimes, as in the specimen which I have figured (fig. 4), the index is a little shorter than the thumb, but this may be abnormal.

At a somewhat earlier age the fingers are comparatively less elongate; a very accurate figure of the hand of such a specimen has been published by Hilgendorf (*l. c.* fig. 1 *e*). In still younger individuals, in which the distance between the external orbital angles measures 20 millim., and in which the hand is only 21 millim. long, the palm presents nearly the same length as the fingers (fig. 7). In specimens in which the distance between the external orbital angles measures only 10 millim., and the larger hand of which is 7–8 millim. long, the fingers are even a little shorter than the palm.

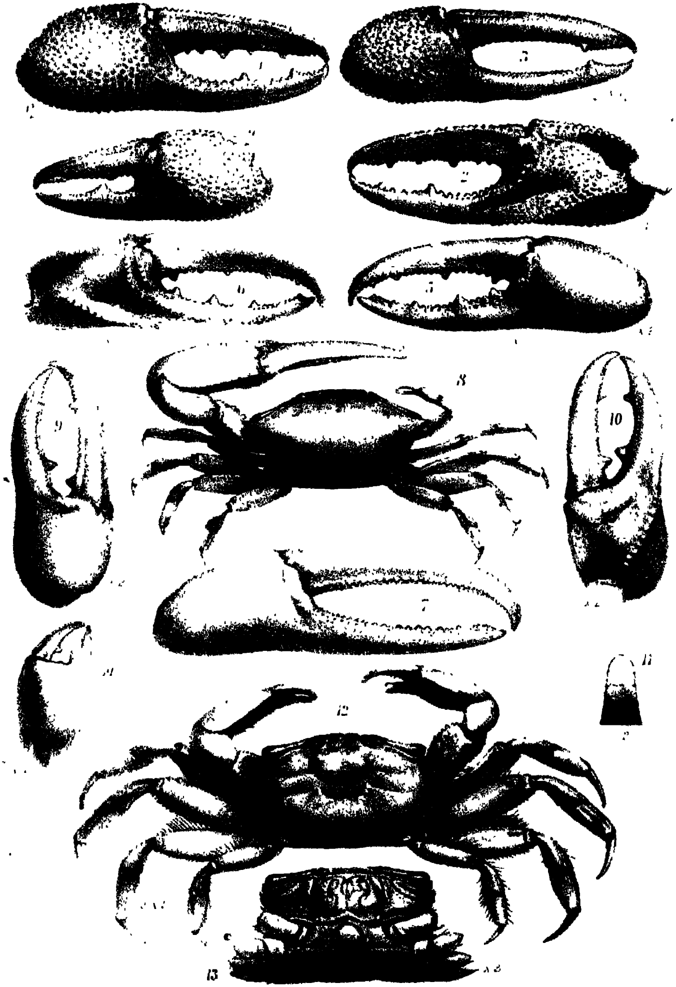
For the form of the ambulatory legs, which are tolerably slender in this species, I refer the reader to my figure and to that given by Mr. Hilgendorf. The following details, however, may be mentioned. The upper margin of the meropodites of the adult male is minutely granular along the distal, and hairy along the proximal half; along the upper and under margins of the meropodites of the three anterior ambulatory legs of the female this granulation is much more developed, the acute granules of the upper margins being arranged in two rows close to one another. In the female a tuft of close short hairs occurs along the under (posterior) margin of the meropodites of the last pair of legs; but it is absent in the male.

The cephalothorax of some of these specimens, preserved in spirit, is dark bluish, whilst in others it is dark green; the larger hand is yellowish or reddish brown.

Dimensions of an adult male specimen:—

	millim.
Distance between the external orbital angles..	33
Length of the carapace (front included)	19
Length of the posterior margin between the insertion of the last pair of legs	13
Length of the larger hand..................	60
Middle length of the palm	20
Length of the fingers......................	40

Among the other species of *Gelasimus* which inhabit the Indo-Pacific Ocean, this species appears to be most closely allied to *G. arcuatus*, de Haan, which, however, may be distin-



Dr De Man

1-4 GELASIMUS ACUTUS 5-7. G ANNULIPES 8-11. G TRIANGULARIS.
12-14. MACROPHTHALMUS ERATO

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guished from *G. Dussumieri*, at first sight, by the somewhat different shape of its carapace, especially by the different direction of its margins. Although *G. arcuatus* has been found in the seas of Japan and New Caledonia, it has not yet been recorded from the Indian Ocean.

Gelasimus Dussumieri has been recorded from Zanzibar, the coast of Malabar, Java (Samarang), and from New Caledonia; so that it seems to be distributed throughout the whole Indian Ocean and the Malayan Archipelago.

The collection of the Leyden Museum contains specimens from Nossy-Faly (near Madagascar), which have been described by Hoffmann (Crustacés de Madagascar, 1874, p 17); but as they differ only from the type of *G. Dussumieri* in the meropodites of their ambulatory legs being slightly more enlarged, and in the joints of these appendages being a little less slender, I regard them only as a local race, or possibly individual varieties of this species.

72. GELASIMUS ACUTUS, *Stimps.* (Pl. VII. figs. 8 & 9, and Pl. VIII figs. 1–4.)

Gelasimus acutus, *Stimpson, Proceed. Acad. Nat. Sci. Philadelphia*, 1858, p. 99.

No fewer than sixty-six specimens were collected, namely forty-eight males and eighteen females. Of forty-six specimens the exact locality is not indicated, the others are from the following localities twelve from Kisseraing, three from King Island, two from Zediwon on the Tenasserim river, two from the bank of Rangoon river, and one from Tavoy.

This species belongs to the same section of the genus as the last. It was discovered by Stimpson off the coast of China, near Macao, and was established by him for the reception of an immature individual, in which the distance between the external orbital angles measured nearly 18 millim., the length of the carapace 10 millim., and that of the larger hand about 22 millim. Specimens from the Mergui Collection which present these dimensions fully agree with Stimpson's diagnosis.

Gelasimus acutus is most closely allied to *G. Dussumieri*, especially in the shape of its carapace, but it may be distinguished by the form of the median frontal furrow and at first sight by the different form of the larger hand of the male, the index of which is constantly armed with two teeth, whereas the immobile finger of the larger hand of *G. Dussumieri* is armed with only one.

The cephalothorax of the largest specimen closely resembles the variety of *G. Dussumieri* described above, which is distinguished by the antero-lateral margin of the cephalothorax not making an angle with the postero-lateral, so that both margins form a single line directed obliquely backwards. In *G. acutus* also the antero-lateral margin never makes an angle with the postero-lateral, at least in none of the Mergui specimens, in the largest of which the distance between the external orbital angles is 25 millim. Nevertheless the cephalothorax may be distinguished even from that variety of *G. Dussumieri*, 1st by its length being somewhat shorter in proportion to its breadth, and 2nd, by the form of the frontal furrow.

The narrow front is scarcely constricted between the insertion of the eye-peduncles, and the rounded anterior margin presents a minute median incision, as in *G. Dussumieri*. The median furrow of the front of *G. acutus* is constantly very broad and much broader than the lateral margins of the front, beyond the middle of which it extends; by this character it therefore differs from *G. Dussumieri*. As in that species, the upper orbital margin is bordered below by an accessory line, which is a little more distinctly granulated. The external orbital angles are very acute and directed obliquely forwards. The epibranchial angle is indistinct, the antero-lateral margin not making an angle with the postero-lateral. As in *G. Dussumieri*, the oblique line which occurs on the lateral surface of the cephalothorax does not reach the lateral margin, but ceases at a short distance from it. The lateral margins are directed very obliquely backward, are minutely granulated, and, as in *G. Dussumieri*, disappear long before reaching the posterior margin of the cephalothorax. The upper surface of the latter is very convex and arcuate longitudinally; although the surface seems to be smooth, it is found, when examined under a magnifying-glass, to be minutely granular and punctate, and more distinctly so in the female than in the male.

Both the males and the females of this species fully agree with *G. Dussumieri* in the form and the structure of the inferior orbital margin, of the pterygostomian regions, of the outer maxillipeds, and even of the abdomen. Stimpson mentions a ridge on the subhepatic region, proceeding parallel to the inferior orbital margin. In *G. acutus*, as in *G. Dussumieri*, I observe a glabrous groove, immediately below the inferior orbital margin, running parallel to it, and separating this margin from the convex, hairy pterygostomian regions. But as I have already remarked, this groove is proper to both forms, and will probably be found in many other species of the genus.

G. acutus therefore closely resembles *G. Dussumieri* in the form of its cephalothorax.

As regards the occurrence of the larger chelipede on the right or on the left side . in thirty-four specimens, twenty-one have it on the right and thirteen on the left side of the cephalothorax.

In its outer appearance the larger chelipede of the male is similar to that of *G. Dussumieri*, and bears the same proportion to the cephalothorax. The three margins of the arm are granular, and the convex outer (posterior) surface of the arm is also covered with small granules, the concave inner surface is smooth and a little hairy, but the anterior surface is smooth and glabrous. The carpopodite is similar to that of *G. Dussumieri*, its rectangular upper surface being covered with small granules fringed with hairs along the anterior margin. The hand is even a little more developed than in *G. Dussumieri*, so that if *G. acutus* attains the same size as that species, its larger hand will probably also become twice as long as the distance between the external orbital angles of the carapace. The height of the hand (*i. e.* of the palm) slightly exceeds a third of the length, so that the hands of the two species much resemble one another in this character; but the fingers are less elongate and shorter in proportion to the length of the palm. In *G. acutus* the fingers are but little longer than the palm, whereas in equally large specimens of *G. Dussumieri* the fingers are once and a half as long as the middle length of the palm. The outer surface of the palm is granulated in the same manner as that of *G. Dussumieri*, and the upper margin also presents two rows of small acute granules, close to one another.

The immobile finger tapers regularly towards its extremity and is considerably curved upward; its outer surface appears smooth to the naked eye, but minutely granular with the aid of a lens, and presents an impressed line parallel to the rounded under margin. The inner margin of the index is constantly armed with two teeth, one a little before the middle, the second a little before the acute extremity, and it moreover bears small tubercles along its whole length. In *G. Dussumieri* the index is constantly armed with one single tooth, the distal tooth not being found in this species. It is therefore always possible to distinguish the species by this character. The two teeth of the immobile finger are, however, not always equally developed; in most cases they are equal to one another, but sometimes the proximal tooth is a little larger. The thumb gradually tapers, though little, towards its hooked pointed extremity; its outer surface appears to the naked eye minutely granular near its articulation; but the whole surface, when examined under a magnifying-glass, appears to be covered with minute granules. The outer surface presents two longitudinal grooves, which, however, disappear a little before the distal third of the length of the finger; the upper broader groove runs close to the upper margin, which appears granular near the base, and the other is a faintly impressed line near the middle of the surface. The inner surfaces of the palm and of the fingers agree with those of *G. Dussumieri*; the inner surface of the palm appears a little granular between the two oblique tuberculated crests, whereas the inner surface of the fingers is quite smooth.

In younger individuals, in which the distance between the external orbital angles measures 19 millim., and the larger hand of which is 22 millim. long, the fingers are about as long or even a little shorter than the palm (Pl. VIII. fig. 4), but the distal tooth of the index is very little developed. Stimpson doubtless established the species on such a specimen. In very young male specimens, the fingers are much shorter than the palm.

In *G. acutus* there is a remarkable variety, in which the inner margins of both fingers are quite unarmed between their base and the distal tooth (fig 3), only the latter, which is characteristic of the species, being present. Amongst thirty-four adult male specimens five belong to this variety.

The ambulatory legs much resemble those of *G. Dussumieri*, but the meropodites of the male are a little more enlarged, and the posterior margins of the meropodites of the last pair of legs of the female are never fringed with the tuft of short hairs found in *G. Dussumieri*. The specimens in spirit have quite a different colour from the similarly preserved specimens of *G. Dussumieri*. The middle portion of the cephalothorax has a dark green colour, but the sides, including the external orbital angles, the lateral surfaces, and the pterygostomian regions, appear yellowish. In some individuals, however, the dark green or rarely bluish colour extends also upon the sides. The outer surface of the palm has a beautiful intense red colour, which is particularly rich near the articulation of the fingers and towards the inner margin. The fingers in some present a fine violet colour, while in others they are yellowish, and the ambulatory legs have also the same colour.

Dimensions.

	♂. mm.	♂. mm.	♀. mm.	♀. mm.
Distance between the external orbital angles	25	23	21¼	20
Length of the carapace (the front included)	14	13	12	11⅓
Length of the larger hand.........	42½	32		
Length of the palm	19	16		
Height of the palm.................	15	12½		
Length of the fingers..............	23½	16		

G. acutus may be easily distinguished from *G. arcuatus*, de Haan, and *G. coarctatus*, M.-Edw., from New Caledonia, by the shape of the cephalothorax. It is possible that some of the species described by Adams and White in the 'Voyage of the Samarang,' may prove to be identical with those of Milne-Edwards; according to Mr. Kingsley, *G. forcipatus*, Ad. and White, is identical with *G. coarctatus*.

G. acutus has hitherto been recorded only from the Chinese coast, near Macao.

78. **Gelasimus annulipes**, *Latr.* (Pl. VIII. figs. 5–7.)

Gelasimus annulipes, *Milne-Edwards, Hist. Nat. des Crustacés*, p. 55, pl. xviii. fig. 10–13, and *Ann. Sci. Nat.* 3 série, t. xviii. p. 149, pl. iv. fig. 15.

Gelasimus pulchellus, *Stimpson, l. c.* p. 100.

Gelasimus annulipes, *Hilgendorf, Crustaceen von Ost-Afrika, in Baron v. d. Decken's Reise*, p. 85; and *Monatsber. d. K. preuss. Akad. d. Wiss. Berlin*, Nov. 1878, pp. 803–805.

Gelasimus perplexus, *Milne-Edwards, l. c.* p. 150, pl. iv. fig. 18 (*teste Hilgendorf*).

Gelasimus annulipes, *Heller, Crustaceen der Novara-Reise*, S. 38.

Gelasimus annulipes, *Miers, Zoology of Rodriguez, Crustacea*, p. 4; and *Ann. & Mag. Nat. Hist.* 5th ser. vol. v. 1880, p. 310.

Gelasimus annulipes, *de Man, Notes from the Leyden Museum*, vol. ii. p. 69.

Gelasimus annulipes, *Kingsley, Carcinological Notes*, II., *Proc. Acad. Nat. Sci. Philadelphia*, 1880, p. 148 *.

Thirty-three specimens (24 ♂, 9 ♀) were collected; nine adult individuals having been found at Sullivan Island, and fifteen young specimens at Elphinstone Island Bay, whereas the others are without a definite locality.

The oblique line on the lateral surface of the cephalothorax extends in this species to the epibranchial angle. The upper surface of the carapace appears minutely punctate, when it is examined under a magnifying-glass. The inferior orbital margin is simple in the male; but in the female it is bordered, at the bottom of the orbits, by an accessory row of small acute granules, close and parallel to it, thus resembling *G. forceps*, M.-Edw. This character was hitherto unknown. Among twenty males, ten have the larger hand on the right and ten on the left side. In all the specimens, except in one variety, each finger of the larger hand is armed, in addition to the other teeth, with a small tooth quite at its base. The inner surface of the palm, besides the oblique tuberculated crest near its under margin, is armed on its anterior margin with two parallel granular crests close to the articulation of the thumb (*Gelasimus pulchellus*, Stimps.). Two or three specimens also present a remarkable variation (fig. 7), differing from the type in the following characters. Although the subterminal tooth of the immobile finger is still more or less developed, the inner margins of the fingers are not armed with the three or four prominent teeth which occur in the type, but present only some small equal granules, especially in their distal halves.

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* Kingsley evidently is wrong when uniting *G. perplexus*, M.-Edw., with *G. chlorophthalmus* (*l. c.* p. 151).

This common Indian species has been collected throughout the whole Indian Ocean, the Malayan Archipelago, and the Pacific Ocean, having been recorded from Zanzibar, Mozambique, Nossi-Bé, Madras, Ceylon, Nicobar Islands, Java, the Philippines, Moluccas, New Guinea, the Fiji Islands, and Tahiti.

74. GELASIMUS TRIANGULARIS, *A. M.-Edw.* (Pl. VIII. figs. 8–11.)

Gelasimus triangularis, *Alph. M.-Edwards. Crustacés de la Nouv. Calédonie, Nouv. Arch. du Museum Hist. Nat.* t. ix. p. 275.

Gelasimus perplexus, *Heller, Crustaceen der Novara-Reise*, p. 38, Taf. v. fig. 4 (*nec Milne-Edwards*).

Thirty-three specimens (24 ♂, 9 ♀) were collected, five of which were found at Kisseraing Island, the other specimens being without a definite locality.

This form belongs to the same section of the genus as the preceding species. In the shape of its cephalothorax it stands in the same relation to *Gelas. annulipes*, M.-Edw., as *Gelas. acutus*, Stimps., does to *Gelas. vocans*, M.-Edw. The carapace of *Gelas. acutus* is much more narrowed behind than that of *Gelas. vocans*, and the cephalothorax of *Gelas. triangularis* is much more narrowed posteriorly than that of *Gelas. annulipes*.

The specimens have been compared and identified with a typical specimen of *G. triangularis* from New Caledonia, in the Paris Museum.

I will now describe this species and compare it at the same time with *Gelas. annulipes*. The cephalothorax is strongly convex and arcuate longitudinally, and much larger in front than at the posterior margin. The upper surface appears perfectly smooth and presents no interregional grooves, so that the grooves, which in *G. annulipes* separate the gastric from the branchial and cardiac regions, are absent in this species. The median frontal groove is also scarcely visible and less distinct than in *G. annulipes*. As regards the shape of the front, both species agree with one another; in both it appears a little punctate when examined under a magnifying-glass.

The external orbital angles are extremely acute and directed transversely outwards and slightly forwards. As in *G. annulipes*, the upper orbital margin is bordered anteriorly by a minutely granulated accessory line, between the front and the orbital angle; this line is situated in this species nearer to the orbital margin than in *G. annulipes*. The oblique line on the lateral surface of the cephalothorax is even shorter than in *G. annulipes*, being almost absent. The lateral margins, consisting therefore almost exclusively of the postero-lateral portion, are directed very obliquely backwards, and, as in *G. annulipes*, they do not extend to the posterior margin. The inferior orbital margin resembles that of *G. annulipes*, but is more delicately crenulated. In the female the accessory line of granules, which is a character of the female of *G. annulipes*, does not occur in this species.

In the structure of the under surface of the carapace, of the external maxillipedes, of the convex and hairy pterygostomian regions, &c., this species is similar to *G. annulipes*. The suborbital groove, between the orbits and the pterygostomian regions, which I found also in *G. Dussumieri* and in *G. acutus*, occurs in this species and in *G. annulipes*, and is probably present in all the species of *Gelasimus*. The fifth joint of the male abdomen in *G. annulipes* is much broader than long and nearly as long as the sixth, whereas in *G. triangularis* the fifth joint is but little broader than long and much longer than the fourth and the sixth.

Among twenty-one males, the larger hand in eleven was found on the left, and in ten on the right side. The larger chelipede presents a striking resemblance to that of *G. annulipes*, but differs from it in some constant characters. The anterior margin of the arm bears a few small tubercles along its whole length, and the other margins are also minutely granular. The upper margin, moreover, is less rounded than in *G. annulipes* and is somewhat more acute. The inner, equally hairy surface of the arm in this species appears therefore more distinctly limited than in the other species. The wrist is similar to that of *G. annulipes*, the upper surface being minutely granular and the anterior margin often presents some small tubercles. The hand is nearly once and a half as long as the distance between the external orbital angles and is nearly three times as long as high. In its outer appearance it closely resembles the hand of *G. annulipes*, in the shape of its palm and the forms of its fingers. The latter in the adult male are but a little longer than the middle length of the palm. The outer convex surface of the palm appears wholly smooth to the naked eye, but often minutely granular towards the upper margin, when examined under a magnifying-glass. On the upper margin of the palm a longitudinal groove occurs, which is not found on the rounded upper margin of the palm of *G. annulipes*. In both species there is also a longitudinal groove on the under margin of the palm but in *G. triangularis* it does not extend upon the index. The impressed line which occurs in *G. annulipes* on the outer surface of the palm, close and parallel to the anterior margin, appears very indistinct in *G. triangularis*. The fingers are somewhat less compressed than those of *G. annulipes*, but in other respects they are very similar in both species. The index is upwardly curved and gradually tapers towards its pointed tip; its outer surface and that also of the mobile finger appear minutely punctate when examined under a magnifying-glass. The inner, rather coarsely granulated margin of the immobile finger is constantly armed with two teeth, one at the base and the other near the distal end of the middle third of the finger; the subterminal tooth which occurs on the index of *G. annulipes* is absent. The mobile finger is similar to that of *G. annulipes*, being a little longer than the index, gradually tapered and strongly arcuate towards its pointed tip. The outer surface is faintly longitudinally grooved, though more distinctly than in *G. annulipes*, but the proximal half of the upper margin appears somewhat granular in both species. The mobile finger of *G. triangularis* is armed along its inner, coarsely granulated margin with only two teeth, one quite at the base, before the basal tooth of the index, and the other almost opposite the second tooth of the latter. In typical specimens of *G. annulipes* the index is also armed, in addition to the strong subterminal tooth which is characteristic of *G. triangularis*, with three other teeth, and the mobile finger with about four.

The inner surface of the palm often appears granular towards its upper margin, and is armed with two strongly tuberculated crests, viz. the ordinary oblique crest bordering internally the under surface of the palm, and another close and parallel to the anterior margin. In *G. annulipes* the inner surface of the palm is armed with three crests, two parallel crests being found near the anterior margin. The inner surface of the fingers is concave and perfectly smooth, as in *G. annulipes*. The ambulatory legs are somewhat less slender than those of *G. annulipes*, especially when the meropodites of the last pair of legs are compared.

Dimensions.

	♂. mm.	♂. mm.	♀. mm.
Distance between the external orbital angles	15	14	12⅓
Length of the carapace (the front included)	8	7½	6½
Length of the larger hand of the male	20	17	
Height of the palm	7⅔		
Middle length of the palm	9	8½	
Middle length of the fingers	11	8½	

The upper surface of the carapace of these specimens (preserved in alcohol) is dark bluish and marked with lighter transverse stripes and spots; in some specimens the carapace appears light green, and ornamented with transverse lines and spots of a darker colour. The larger hand appears uniformly yellowish.

Gelasimus triangularis, which is distinctly separated from the other Indian species of this group, viz. *G. annulipes*, *G. lacteus*, *G. Gaimardi*, *G. chlorophthalmus*, and *G. Latreillii*, by the shape of its carapace and the structure of its larger hand, has hitherto been recorded only from the shores of New Caledonia. It will doubtless, however, be found to occur throughout the whole Malayan Archipelago.

GENUS MACROPHTHALMUS, *Latr.*

75. MACROPHTHALMUS TOMENTOSUS, *Eyd. & Soul.*

Macrophthalmus tomentosus, *Eydoux & Souleyet, Voyage autour du Monde sur la corvette 'La Bonite,' Zoologie*, t. i. p. 243, pl. iii. fig. 8 (Paris, 1841).

Macrophthalmus tomentosus, *Milne-Edwards, Ann. Sci. Nat.* 3ᵉ série, t. xviii. p. 159; *Alph. Milne-Edwards, Nouv. Arch. du Muséum Hist. Nat.* ix. p. 279.

Seven fine specimens (4 ♂, 3 ♀) were collected in the Mergui Archipelago.

This species is closely allied to *Macrophthalmus depressus*, Rüpp., and *M. japonicus*, de Haan, but it may be easily distinguished by the shape of its carapace, which is remarkably narrowed anteriorly. Nearly the whole upper surface of the cephalothorax is covered with minute granules, but the mesogastric lobe is smooth and frequently the middle of the anterior cardiac region. The branchial regions present two somewhat oblique and parallel granular ridges, and the margins also of the cephalothorax appear granular. The lateral margins diverge considerably backwards in this species, and present three incisions, the anterior being the most distinct; the second is found nearly in the middle, or a little before the middle, of the lateral margin, and the third incision is so very indistinct, that it may easily be overlooked. A short transverse granular ridge is also found above the insertion of each of the two posterior legs, close and parallel to the posterior margin of the carapace.

The chelipedes of the adult specimens are nearly equal to one another. The upper margin of the arm is somewhat granular, also the external margin; both the upper and the anterior margins of the arm are clothed with rather long hairs. The inner surface of the arm is armed with a short, horny, longitudinal crest, situated close to and a little beyond the middle of the anterior margin and parallel to it. This crest, which was not described by Messrs. Eydoux and Souleyet, is doubtless homologous with the "musical crest" of the genera *Metaplax* and *Helice*, described further on. The chelipedes of the female, as is usual, are much smaller than those of the male, and the inner surface of the arm is not provided with the horny musical crest characteristic of the latter sex.

In the male, the upper surface of the wrist and the outer surfaces of the hands and fingers are quite smooth; the upper margin of the palm, however, is a little granular at its proximal end. Both fingers have somewhat excavated, spoonlike tips; the inner margin of the immobile finger is armed with a strong, minutely denticulated tooth a little before its middle, and with a dozen very small teeth between the large tooth and the tip. The mobile finger is minutely granular on its upper margin, when examined under a lens; and its inner margin presents a small, somewhat quadrangular tooth at the base, and fourteen or fifteen very small teeth between the quadrangular tooth and the tip, similar to those of the index. The inner surface of the palm is unarmed, smooth, and covered with a close down of hairs; in many specimens, however, and perhaps always in the adult, these hairs are nearly wanting, being probably worn off, so that the inner surface of the palm appears glabrous. The inner surface of the fingers is always clothed with rather long hairs.

The meropodites of the antepenultimate and penultimate pairs of the ambulatory legs are rather enlarged, so that those *e. g.* of the antepenultimate pair are only twice and a half as long as broad. The dactylopodites are lanceolate and much depressed.

Dimensions of an adult male and of an ova-bearing female:—

	♂. mm.	♀. mm.
Distance between the extraorbital angles, being the first teeth of the lateral margins	28½	21⅔
Distance between the second teeth	30½	23⅔
Distance between the third teeth (being those which are found on the middle of the margins)	34	26
Length of the carapace (the front included) ..	23	18

Macrophthalmus tomentosus is a rather rare species, and has hitherto been recorded only from the Philippine Islands, the Aru Islands, and New Caledonia.

76. MACROPHTHALMUS DEPRESSUS, *Rüpp.*

Macrophthalmus depressus, *Rüppell, Krabben des Rothen Meeres*, p. 19, Taf. iv. fig. 6.

Macrophthalmus depressus, *Milne-Edwards, Ann. Sci. Nat.* 3^{e} série, t. xviii. p. 159.

Macrophthalmus depressus, *de Man, Notes from the Leyden Museum*, vol. iii. p. 255.

Two male specimens were collected along with the preceding species.

This species is most closely allied to *Macrophthalmus japonicus*, de Haan, and I have already enumerated the distinctive characters of both species in my note quoted above. In the form and structure of the cephalothorax both species completely resemble one another. In these specimens the inferior margin of the palm is rounded and granular, whereas in *M. japonicus* it is rather acute. The upper margin of the mobile finger is smooth, while in *M. japonicus* it is granular. The inner surfaces of the palms and fingers are densely clothed with hairs.

Dimensions of the larger specimen :—

Breadth of the cephalothorax (distance between the second antero-lateral teeth)	23 mm.
Length of the cephalothorax	15 mm.

I may here observe that the specimen which Mr. Miers regards as *Euplax Boscii*, Aud. (Zoology of H.M.S. 'Alert,' 1884, p 542), is probably some other species. In *Euplax Boscii* the lower finger is not at all deflexed, so that it does not make an angle with the lower margin of the palm. *Euplax Boscii* and *M. depressus*, Rüpp., are perfectly distinct species.

Macrophthalmus depressus has hitherto been recorded only from the Red Sea.

77. MACROPHTHALMUS ERATO *, n. sp. (Pl. VIII. figs. 12–14.)

Seven specimens (4 ♂, 3 ♀) of this small interesting species were collected.

M. Erato belongs to the last section (B) of the genus in Milne-Edwards's Monograph, in which the eye-peduncles do not extend beyond the orbits, and in which the cephalothorax is less than twice as broad as long. In all the species of this section the inner surface of the hands is unarmed, so far as I am aware; in this new species it is, however, armed with a short acute spiniform tooth, so that *M. Erato* differs in this character from all the species of that section. It is most closely allied, as regards its outer appearance, to *M. quadratus*, A. M.-E., from New Caledonia; but it may be distinguished, according to Prof. A. Milne-Edwards, who kindly compared a specimen for me with *M. quadratus*, by the different structure of its orbits, and by its comparatively longer, more compressed, and more carinate hands.

The cephalothorax, which is as broad anteriorly as posteriorly, is once and a half as broad as long, the distance between the second antero-lateral teeth, where the carapace presents its greatest width, being, in proportion to the length, as 3 : 2. The regions are distinctly indicated by interregional grooves proper to the *Macrophthalmi*. The cervical suture is deep in its median posterior portion, which separates the gastric region from the cardiac region, as well as in its lateral branches which define the hepatic from the epibranchial region. The grooves which separate the protogastric from the hepatic region and those which separate the epibranchial from the mesobranchial regions, are also distinct, but the branchio-cardiac sutural lines are faintly marked. The anterior is nevertheless distinctly defined from the posterior cardiac region, and even the grooves which define the mesogastric from the protogastric area are faintly indicated. Furthermore, on each side of the carapace a groove is observed close and parallel to the posterior margin of the cephalothorax, above the bases of the posterior legs.

---

* *Erato*, one of the Nereids.

The upper surface is granular anteriorly and on the lateral regions; the granules present the following distribution. A few granules are found on the anterior and lateral portions of the gastric region, but more numerous and somewhat larger granules are observed on the hepatic and branchial regions. No granules are found on the mesogastric and cardiac regions. The upper surface, especially posteriorly, is also seen to be punctate, when examined under a magnifying-glass, and is slightly pubescent, especially in the interregional grooves and on the lateral regions. The front is strongly, nearly vertically, deflexed; its breadth, measured between the eye-peduncles, is a fifth of the distance between the external orbital angles. Its anterior margin is slightly emarginate in the middle, and the antero-external angles are rounded; its upper surface is minutely granulate and slightly pubescent, and is bordered posteriorly by the two ridge-like, transverse, smooth, epigastric lobes, and presents a faintly marked mesial furrow, which is bifurcated immediately behind the epigastric ridges, the two bifurcations including the anterior end of the mesogastric area.

The orbits are transverse and their upper margin is minutely denticulate or crenulate. The lateral margins of the cephalothorax, which are nearly straight, present three acute teeth, including the external orbital angles. The first tooth, or external orbital angle, is acute and directed outwards and slightly forwards; the external margin of this tooth is armed with two or three minute teeth. The first antero-lateral tooth is separated from the next by a deep triangular incision. The second tooth is much larger than the first, about once and a half as long, and is very acute; being directed also transversely outwards and forwards, it projects a little more outwards than the first tooth, so that the cephalothorax presents its greatest width between the second teeth. The external margin of the second tooth is also minutely denticulate, presenting four or five minute teeth. The third tooth is very small, and separated from the preceding by a minute notch.

The structure of the inferior orbital margin of the male is very characteristic, and different from that of *M. quadratus*. The inferior orbital margin presents in its middle a broad, though little prominent, slightly triangular lobe, which is directed somewhat downwards, its obtuse tip being found at the internal or median side; the upper surface of this lobe is slightly concave. Behind this lobe, the inferior margin of the orbits presents a second, also obtuse, much smaller lobule, which is found at the external end of the under margin; whereas the internal or median part of the under margin, lying between the larger middle lobe and the epistome, is armed with a row of seven or eight minute rounded granules, the external one of which is the largest, whereas the others successively decrease in size towards the epistome, *i. e.* towards the inner end of the orbital margin.

The inferior orbital margin of the male *M. quadratus*, on the contrary, presents three prominent rounded lobes. In the female the inferior orbital margin is regularly and delicately crenulate, as in the female of *M. quadratus*. The eyepeduncles are quite as long as the orbits. The somewhat hairy pterygostomian regions and the inflected sides of the cephalothorax present the ordinary structure seen in other species of this genus. The external foot-jaws have also the ordinary form. The sternum and the male abdomen are smooth and glabrous, and sparsely and minutely punctate; all the joints of the male abdomen are distinct. The abdomen of the female occupies the under surface of the cephalothorax, lying between the legs, and its margins are fringed with hairs.

The anterior legs of the male are equal to one another in three specimens and unequal in the fourth; in their general appearance they resemble those of *M. quadratus*. The anterior margin of the arm, which is a little dilated at the distal end, and the two other margins, are armed along their whole length with many small acute teeth. The "musical crest" lies on the somewhat hairy, upper surface close to the middle of the anterior margin and parallel to it. The outer and the under surfaces are also hairy. The wrist presents some acute granules at its internal angle; its upper surface is smooth. The hands are similar to those of *M. quadratus*, but they are a little longer, more compressed and more carinate. The palm is longer than its greatest vertical depth, at the articulation with the mobile finger, the length being in proportion to that depth as 15 : 11. The hands are much compressed; the outer surface of the palm appears smooth to the naked eye; the upper margin is carinate and granular, and the somewhat rounded under margin is also a little granular. When the outer surfaces of the palm and fingers are examined under a sufficiently powerful lens, they appear to be uniformly covered with innumerable minute granules. The inner surface of the palm is densely covered with a tuft of hair, and armed a little before the middle with an acute spiniform tooth. The cephalothorax of all other species, in which the inner surface of the hands is spiniferous, is much more enlarged, being at least twice as broad as long. The fingers resemble those of *M. quadratus*. The lower margin of the immobile finger is in a straight line with the lower margin of the palm, and its outer surface is longitudinally grooved near the under margin. The upper or inner margin presents a strong longitudinal tooth, occupying its proximal half, and this tooth is minutely crenulate or denticulate above; two or three very small teeth are also to be observed between the horny excavated tip and the large proximal tooth. As in *M. quadratus*, the fingers, when closed, meet only towards their apices, there being a hiatus between them; the inner margin of the mobile finger has a small, quadrangular, minutely crenulate tooth near its base, and a few minute teeth before the excavated tip. The spoon-like excavated tips are somewhat hairy.

The chelipedes of the female are, as usual, much smaller than those of the male. Their arms have entire margins, the upper and anterior margins being clothed with rather long hairs. The "musical crest" is wanting. The wrist is also somewhat hairy on its inner surface. The small hands, including the fingers, are nearly thrice as long as high. The palm near its lower margin presents a longitudinal groove, which extends upon the immobile finger; the upper margin of the palm and of the mobile finger are longitudinally grooved, the grooves reaching to their tip. The fingers are scarcely longer than the palm, and their excavated tips are hairy. The inner margins of the fingers present only a few very minute teeth, so that they appear entire to the naked eye. The inner surface of the palm is unarmed.

TREASURER'S Account for the year from May 1, 1886, to April 30, 1887. (Presented at the Anniversary Meeting, Tuesday, May 24, 1887.)

Receipts and Payments.

Receipts.				£	s.	d.
Balance at Bankers' on 1st May, 1886				381	12	9
Interest on Investments				190	14	0
Admission Fees				288	0	0
Annual Contributions				1260	3	0
Compositions				180	0	0
Sales of Publications:—						
Transactions	£145	16	7			
Journals	116	10	10			
Proceedings and Catalogues	3	1	6			
				265	8	11
Donation				113	10	2
				£2679	8	10

Payments.				£	s.	d.
Taxes and Insurance				22	13	9
Repairs and Furniture				38	0	10
Coals and Gas				69	5	0
Salaries and Commission				431	13	4
Library:—						
Books	£140	6	5			
Binding	82	8	2			
				222	14	7
Expenses of Publications:—						
Printing	£583	15	6			
Illustrations	631	5	5			
Distribution	68	7	4			
				1283	8	3
Miscellaneous Printing and Stationery				65	14	0
Petty expenses (including Tea and Postage)				74	10	4
Investment				150	0	0
Balance at Bankers' on 30th April, 1887				321	8	9
				£2679	8	10

Investments on 30th April, 1887.

	£	s.	d.
Consols	3511	19	0
Metropolitan Board of Works 3½ per cent. Stock	1184	15	11
Great Indian Peninsula Railway 5 per cent. Guaranteed Stock	938	14	0
Do. Do. Do. 4 per cent. Debenture Stock	108	0	0
Forth Bridge Railway Co. 4 per cent. Stock	495	0	0
	£6238	8	11

FRANK CRISP, *Treasurer.*

The foregoing accounts have been examined and found correct. { FRED. V. DICKINS, WILLIAM CARRUTHERS, ALBERT D. MICHAEL, B. DAYDON JACKSON, } *Auditors.*

May 12, 1887.

NOTICE.

The irregularity in the issue of Numbers of the Journals in sequence is due to separate Volumes being issued concurrently.

Journal of Zoology.

Vol. XX., when completed, will contain **Nos. 116 to 125** inclusive.

Of this Vol. there has been published Nos. 116, 117, and 118.

Vol. XXI.—Devoted to the Fauna of the Mergui Archipelago, when completed, will contain **Nos. 126 to 135** inclusive.

Of this Vol. there has been published Nos. 126, 127–128, 129, and 130.

Vol. XXII. will consist only of Dr. De Man's Crustacea of the Mergui Archipelago, commencing **No. 136,** now published No. 137, and this Vol. may run to six Parts.

Fellows are requested to compare the Numbers given above with their series before inquiring as to supposed missing Parts.

For issues of Botany, see notice on back of the Botanical Journals.

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THE JOURNAL

OF

THE LINNEAN SOCIETY.

Vol. XXII. **ZOOLOGY.** No. 138.

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The ambulatory legs are similar to those of *M. quadratus*, and their margins are clothed with some hairs. The meropodites of the legs of the third and fourth pair are armed on their upper margin, a little before the distal end, with an acute spinule, but those of the second and fifth are unarmed. The meropodites are minutely denticulate along the distal half of their under margin, especially those of the legs of the third and fourth pair; this denticulation, however, is so minute that it is only visible by means of a strong magnifying-glass.

Dimensions:—

	♂. millim.	♀. millim.
Distance between the external orbital angles	9½	11
Distance between the second antero-lateral teeth	9⅕	11⅖
Length of the cephalothorax	6½	7⅕
Breadth of the front, between the eye-peduncles	2	2¼
Length of the hand (fingers included)	8	4¾

Genus DOTILLA, *Stimps.*

I propose to unite this with the genus *Scopimera*, de Haan, as the two present distinct natural affinities; they not only resemble one another as regards their outer appearance and their essential characters, but both are provided with the singular "tympana" on the meropodites, rarely also on the sternum, which, so far as I am aware, are not found in any other Crustacea. De Haan separated the *Scopimeræ* from the *Dotillæ* on account of the merus-joint of the outer maxillipeds being longitudinally sulcate in the *Dotillæ* and smooth in the *Scopimeræ*. This character, however, is now proved to be only of specific value by a new species in the collection. The form in question agrees closely with the true *Dotillæ*, and more especially resembles *Dotilla sulcata*; but the merus-joint of the external maxillipeds shows only partially the longitudinal grooves characteristic of Forskål's species.

Three species of *Dotilla* have hitherto been described: the long-known *D. sulcata*, Forsk., from the Red Sea, *D. myctiroides*, M.-Edw., from the coast of Malabar, and *D fenestrata*, Hilgend., from the eastern coast of Africa.

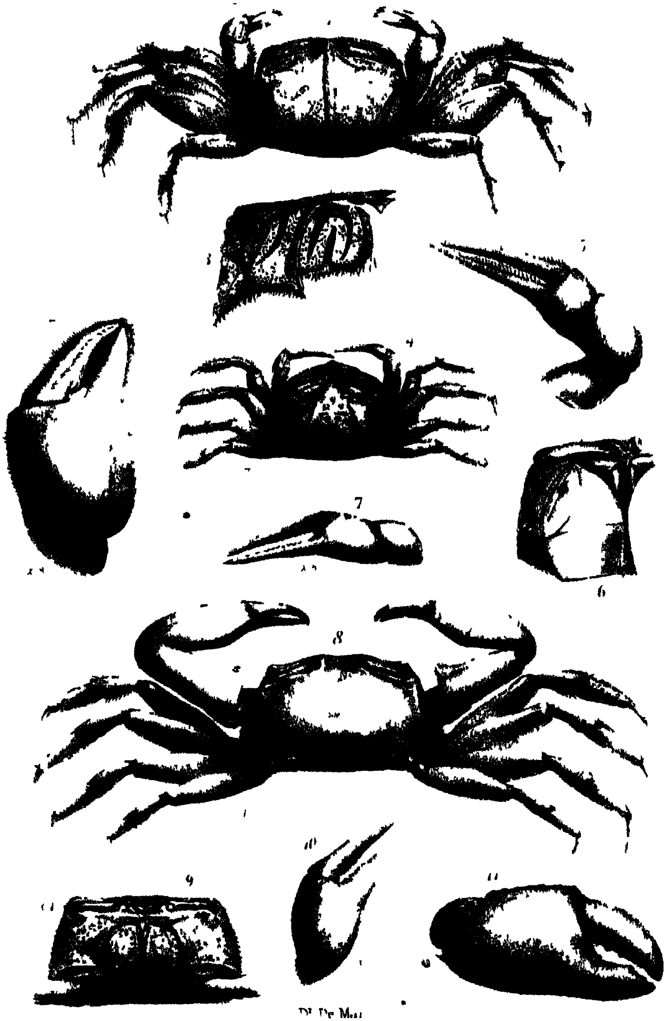
I am now able to describe two new species of this interesting genus.

78. Dotilla brevitarsis, n. sp. (Pl. IX. figs. 1–3.)

Four specimens were collected in the Mergui Archipelago. This new species may be easily distinguished by the following characters:—From Forskål's *D. sulcata*, by the surface of the cephalothorax being differently grooved, by the carpopodite of the chelipedes being armed with a small acute spine at its internal angle, by the meropodites of the ambulatory legs being more enlarged, by comparatively much shorter dactylopodites, which are shorter than the propodites, and by many other characters. It differs also from *Dotilla myctiroides*, M.-Edw, from the coast of Malabar, by the upper surface of the cephalothorax being also sulcate and by the short, not slender chelipedes. *D. fenestrata* may be distinguished from it at first sight by the remarkable "tympana" which occur on the sternum.

I will now compare our new species with *D. sulcata*, two fine specimens of which, collected in the Red Sea, were kindly sent me by the Curators of the Leyden Museum.

In *D sulcata*, Forsk. (*conf.* Milne-Edwards, Règne Animal de Cuvier, pl. xviii fig. 3), the frontal groove is continued backward only to the mesogastric region, where a prominence or tubercle is found. Before this prominence it divides into two branches, each of which is immediately again dichotomously divided into two grooves, one of which is directed obliquely forwards towards the external orbital angles, and the other proceeds obliquely backwards towards the bases of the last pair of ambulatory legs. A five-rayed star of grooves is thus formed on the anterior and antero-lateral portions of the cephalothorax, one of the rays of which, the frontal groove, is placed in the middle line of the carapace. The two posterior rays or grooves are longer than the other three, and are accompanied on each side by a supplementary groove; the external one (*a*) proceeds forwards at a little distance from and parallel to the lateral margin of the carapace, dividing into two short grooves at its anterior end; the internal one (*b*) is directed obliquely forwards from the base of the last pair of legs to the urogastric portion of the gastric region. The cardiac and intestinal regions of the cephalothorax, bordered on each side by the oblique groove (*b*),



Dr De Man

1-3. DOTILLA BREVITARSIS. 4-6 [illegible] MEL[illegible] [illegible] S[illegible]AIA

[illegible] lith. 8-10. DIOXIPPE [illegible] ENIA [illegible] METOPOGRAPSUS MESSOR. Mintern imp.

appear in this species quite smooth and ungrooved. On each side of these smooth regions there are therefore three principal grooves nearly parallel to one another and directed obliquely forwards and inwards. The lateral margins are ciliate, present a small emargination immediately behind the external angles of the orbits, and are directed obliquely backwards to the bases of the fourth pair of legs.

In its general appearance the cephalothorax of *D. brevitarsis* resembles that of *D. sulcata*, but the upper surface is grooved in a different manner. The upper surface is a little broader than long, a little convex longitudinally as well as transversely, and distinctly sulcate. The front resembles that of *D. sulcata*, is strongly deflexed, as in that species, but is less narrowed and more rounded anteriorly. It is broadly grooved, the groove occupying, as in *D. sulcata*, nearly the whole breadth of the front; this groove is prolonged backwards, in the middle line of the cephalothorax, to the posterior cardiac region, where it is a little narrowed, and issues into a transverse groove, which runs parallel to the posterior margin of the carapace at a short distance from it. The five-rayed star of grooves, which occurs in *D. sulcata* anteriorly, is absent in *D brevitarsis* The lateral margin is ciliate, and presents a slight emargination immediately behind the external orbital angle, as in *D. sulcata*; about its middle, however, the margin is a little curved inward, so that its course is rather sinuous, and it terminates above the base of the last pair of legs. The lateral margin is bordered, on the upper surface of the carapace, by a groove which corresponds to the groove (*a*) of *D. sulcata*, described above; another groove, proceeding on the epibranchial region, issues into the lateral groove at about the middle of its length. On each side of the upper surface another transverse groove is found a little behind and parallel to the upper orbital margin, proceeding from the internal angles of the orbits towards the anterior portion of the lateral margin; this groove, into which a small and short groove issues about the middle of its posterior margin, is separated from the upper margin of the orbits by an ovoid prominence. Furthermore, those portions of the upper surface which lie between the broad median furrow and the grooves (*a*) of the lateral margins are somewhat unequal. The elevated portions of the upper surface, by which the grooves are separated from one another, are covered with minute tubercles or granules.

As regards the inflected regions of the carapace, *D. brevitarsis* much resembles *D. sulcata*, the pterygostomian and subhepatic regions being sulcate, whereas the posterior or subbranchial portions of the under surface are not grooved, but covered with short cilia; the grooves of the pterygostomian and subhepatic regions are, however, in *D. brevitarsis* a little more numerous and narrower. Furthermore, on the posterior portion of the under surface a row of cilia occurs, proceeding from the anterior part of the lateral margin of the upper surface to the base of the fourth pair of legs.

The outer foot-jaws (fig. 3) also closely resemble those of *D. sulcata*; the merus-joint is larger than the ischium-joint, which is quite smooth; both joints are separated by an almost transverse suture. The merus-joint presents four longitudinal narrow grooves, arranged in such a manner that the elevated parts, which separate the grooves from one another, constitute a W-like figure, the opening of which is directed forward. As on the upper surface of the cephalothorax, the elevated ridges on the merus-joint of the maxillipedes and on the subhepatic and pterygostomian regions are covered with small granules. The sternum is smooth, and does not present the ovoid membranaceous plates which are characteristic of *D. fenestrata*. The abdomen of the male, however, has a characteristic form and differs much from that of *D. sulcata*. The terminal or first joint is triangular, being as long as broad at the base and rounded at the tip; the second is as long as the terminal joint, scarcely broader than long, and with somewhat arcuate lateral margins; the third joint is nearly as long as the second and about as broad as long, presenting a small contraction close to the posterior margin; the fourth joint is only half as long as the second, but is remarkably enlarged on each side and narrowed again posteriorly, thus forming a rounded lobe on each side; the fifth joint is a little shorter than the fourth and is also dilated on each side, though not so much as the fourth joint; the sixth somite is shorter than the fifth, scarcely enlarged, so that it is three times as broad on its anterior margin as it is long; the seventh or basal joint is a little longer than the sixth, and provided with a transverse elevated crest. The lateral margins of the abdomen are fringed with long hairs.

In the female the terminal joint is triangular as in the male, and rounded at the tip; but the other joints are all enlarged laterally, become gradually narrow towards their posterior margins, and gradually decrease in length.

The chelipedes, which are comparatively as long as those of *D. sulcata*, measuring about twice the length of the carapace, are nearly equal, both in the male and in the female. They are slender in *D. myctiroides*, but in *D. brevitarsis* are short and broader, in this respect resembling a little those of *D. sulcata*. The arms are short, smooth, and unarmed; the carpopodite is nearly cuboid, its upper (outer) surface is smooth, convex, and armed at the internal angle with a small acute tooth. The internal plain surface of the wrist is a little hairy. The hands (fig. 2) are short, being only twice as long as broad (the palm and the fingers taken together), whereas in *D. sulcata* they are about three times as long as broad.

The fingers are as long as or scarcely longer than the palm, whereas in *D. sulcata* the fingers are once and a half as long as the palm. In other respects the hands of this species much resemble those of some species of *Ocypoda*, *e. g.* those of young specimens of *O. ceratophthalma*. They are much compressed and are a little arcuate, so that the outer surface appears convex and the inner concave. The upper margin of the palm is cristate, minutely serrate and hairy, the outer surface smooth, covered with a few small hairs, and marked with a piliferous, longitudinal, elevated line, close to the under margin, to which it runs parallel, proceeding upon the immobile finger. The under margin of the palm itself is carinate, like the upper margin, and also minutely serrate. The compressed fingers are nearly close together, and their somewhat curved, pointed tips cross one another; the inner edges are minutely serrate or denticulate and piliferous. The upper margin is carinate and piliferous, the under margin also carinate and microscopically serrate, being a continuation of the under margin of the palm. The outer surface of the fingers is smooth and almost glabrous, but each is marked with a longitudinal, elevated, piliferous line on the middle of the outer surface, that of the index being the continuation of the elevated line which occurs on the inferior part of the outer surface of the palm. The inner surface of the palm is slightly hairy and also marked with a piliferous line on the under half, which proceeds upon the inner surface of the index, and the inner surface of the mobile finger is equally marked with a longitudinal, elevated, piliferous line. On the under margin of the index a small tuft of longer hairs is situated close to the tip.

The ambulatory legs are very characteristic and differ much from those of *D. sulcata*. The legs of the first pair are a little longer than the chelipedes, those of the second and third pair are again a little longer than the ambulatory legs of the first pair, and those of the last pair are about as long as those of the first pair. The meropodites of all the legs are enlarged, so that, *e. g.*, those of the ambulatory legs of the second and third pair are little more than twice as long as broad, whereas in *D. sulcata* these joints are slender. The meropodites of all the ambulatory legs are provided with rather large "tympana," which occupy nearly the whole surface of the joints, those of the last pair being only a little smaller *. The meropodites of the legs of the first pair are armed at the distal end of the upper margin with two or three small acute teeth, those of the legs of the second and third pair present a row of small acute teeth along the distal half of the upper margin, which gradually increase in size towards the distal end; the meropodites of the last pair only present one or two small teeth at the distal end of the upper margin. The upper margins of the meropodites bear a few small hairs, but the under margins of the meropodites of the ambulatory legs of the first and second pair are densely clothed with many long hairs. The carpopodites and propodites of the ambulatory legs are very similar to those of *D. sulcata* as regards their relative length; these joints are slightly hairy, but the carpopodites of the legs of the first and second pair present a tuft of hairs on the upper surface close to the articulation with the propodites, and the propodites of these legs a similar tuft on the upper surface close to the articulation with the carpopodites.

The dactylopodites are very characteristic, for they are a little shorter than the propodites; they are laterally compressed, elongate-triangular, sharply pointed, and fringed with hairs on the lateral margins. The cephalothorax of the largest specimen is nearly 10 millim. broad.

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* According to Dr. Hilgendorf (Crustacea von Ost-Afrika in Baron v. d. Decken's Reise, p. 86) the meropodites of the last pair of legs of *D. sulcata* should present no "tympana;" in the two specimens of that species, however, which I have before me the meropodites of the last pair of legs are provided with very small ovoid "tympana," situated in the middle of the joints.

79. DOTILLA INTERMEDIA, n. sp. (Pl. IX. figs. 4–6.)

No fewer than thirty-two specimens, all males, were collected on the coast of Sullivan Island. This pretty small crustacean presents a much more striking resemblance to Forskål's *D. sulcata*, from the Red Sea, than *D. brevitarsis*, for the cephalothorax is grooved almost in the same manner, and the legs also much resemble those of that species. Nevertheless, it may be distinguished at first sight by the merus-joints of the outer maxillipeds being not longitudinally sulcate as in the typical *Dotillæ*, the internal half of these joints at least being quite smooth. Though these joints are still larger than the ischium-joints, they, however, present a remarkable transition towards the true *Scopimeræ*, in which the merus-joints of the external maxillipeds are as little sulcate as in *D. intermedia*.

The cephalothorax nearly resembles that of *D. sulcata*, being a little broader than long; as regards the form of the front and the manner in which the upper surface of the carapace is grooved, both species perfectly agree with one another, *D. intermedia* presenting also a five-rayed star of grooves anteriorly, the frontal groove reaching only to the gastric region. It nevertheless differs from *D. sulcata* in the presence of a transverse groove close and parallel to the posterior margin of the cephalothorax, which occurs also in *D. brevitarsis*. The gastric region bears five small tubercles, one on the mesogastric, one on each hypogastric, and two on the urogastric lobe. The elevated parts of the upper surface are minutely granular, as in the other species. As regards the inflected portions of the cephalothorax, *D. intermedia* agrees with *D. sulcata*, the pterygostomian and subhepatic regions being sulcate.

The merus-joint of the outer foot-jaws of *D. sulcata* is nearly twice as large as the ischium-joint, whereas in *D. intermedia* (Pl. IX. fig. 6) it is but little larger. The suture that separates these joints from one another is transverse. The ischium-joint is nearly quadrangular and smooth. The merus-joint is extremely characteristic, and has a more equilaterally triangular form, the external and internal margins being arcuate. The outer surface does not present the W-like figure that characterizes this joint in *D. sulcata* and *D. brevitarsis*, but the internal half appears quite smooth, somewhat as in *Scopimera globosa*; a slight angular depression, however, is found on the surface of the merus-joint anteriorly, the corner of the angle being the anterior tip of the joint and the opening being directed backward; moreover a piliferous elevated and curved line proceeds from the external angle of the posterior margin of the joint into the angular depression, which I have described. The sternum is smooth, without "tympana." The abdomen of the male perfectly resembles that of *D. sulcata*, the anterior margin of the fourth joint being emarginate in the middle and also piliferous; the second (penultimate) joint is a little more than twice as broad as long and shorter than the rounded terminal joint, the base of which is a little broader than long.

With respect to the chelipedes and the ambulatory legs, *D. intermedia* nearly agrees with *D. sulcata*; but the following differences may be observed. The fingers of the chelæ in *D. intermedia* (fig. 5) are comparatively a little longer than those of *D. sulcata* (fig. 6), being about 2½-3 times as long as the palm, in *D. sulcata* only 1½ times. The fingers therefore are very slender and gradually taper into an acute point; they are minutely denticulate at the base, somewhat as in Forskål's species. The ambulatory legs fully resemble those of *D. sulcata*. The meropodites are all provided with "tympana," and those of the last pair have the tympana almost half as long as the joint. The propodites are more distinctly longitudinally grooved on their outer surface than those of *D. sulcata*: the dactylopodites also resemble those of that species; those of the last pair of legs, however, are comparatively a little longer, measuring nearly twice the length of the propodites. The legs are somewhat hairy.

This *Dotilla* is much smaller than the other species, the cephalothorax being only 4-4½ millim. broad.

DIOXIPPE *, nov. gen.

Cleistostoma, *de Haan*, partim.

The genus *Cleistostoma* was founded by de Haan upon two Japanese species—*C. dilatata* and *C. pusilla*. An examination of a large number of specimens of the latter species which I found in a small collection of Japanese Crustacea, kindly presented to me by Dr. Anderson, now makes it very probable that the two species of *Cleistostoma* described in the 'Fauna Japonica' are not so closely allied to one another as de Haan supposed, and that they are even generically distinct. De Haan had only young male specimens of *C. pusilla* at his disposal, whereas my specimens are of a larger size, and there are both males and females among them; so that I have been enabled to observe some characters that were overlooked by de Haan. I find that the merus-joint of the external maxillipeds of *C. pusilla* has not the same quadrate form of the ischium-joint, but that the outer foot-jaws of this species resemble much more those of some *Dotillæ*. The external maxillipeds of *Cleistostoma dilatata*, figured by de Haan, on the contrary, have a different form, their merus-joint being as quadrate as the ischium-joint. Moreover, the meropodites of the ambulatory legs of *C. pusilla* present traces of the remarkable "tympana" which are so characteristic of the true *Dotillæ* and *Scopimeræ*; though small, they are quite distinct on the outer surface of the meropodites of the last pair of legs in the male. These "tympana" were overlooked by de Haan, who had only small specimens at his disposal, as I have already observed. Furthermore, the whole outer appearance of *Cleistostoma dilatata* is quite different from that of *C. pusilla*, the lateral margins of the cephalothorax of the former species presenting none of the small emargination immediately behind the external orbital angles which characterizes *C. pusilla*, and is also observed in many species of *Dotilla*, and the front is much broader in *C. dilatata* than in the other species.

The Mergui collection contains an interesting new species, which agrees in many essential characters with *Cleistostoma pusilla*, though specifically distinct. I propose, therefore, for these two species the new genus *Dioxippe*, which may be distinguished from the genera *Dotilla* and *Scopimera* chiefly by the shape of the cephalothorax, which is not globose, but rather depressed and distinctly broader than long. In other respects *Dioxippe* appears most closely allied to *Dotilla* and *Scopimera*, especially to the former. The external maxillipeds much resemble those of *Dotilla*, differing from those of *Scopimera*. They meet along their inner margins; the quadrangular ischium-joint is a little broader than long, and presents on its smooth outer surface a transverse arcuate piliferous line proceeding from the middle of the external margin towards the internal half of the anterior margin. The commissure between this joint and the merus-joint is transverse. The merus-joint is a little longer than the ischium-joint, and has the same form as in the genus *Dotilla*; but it presents only a single longitudinal groove quite near the external margin, without any trace of the grooves that characterize most species of *Dotilla*. The anterior margin is very narrow and slightly concave, and bears the palpus near the external angle. The cephalothorax does not present the singular grooves of the genus *Dotilla*. The front is narrow, the orbits more or less oblique and elongate; their inferior margin is very prominent, its external angle even constituting a prominent obtuse triangular lobe in *Dioxippe orientalis*. The meropodites of the ambulatory legs present more or less distinct traces of the singular "tympana" which are so much developed in *Dotilla*, and still more in *Scopimera*.

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* *Dioxippe*, one of the Heliadæ.

I thus retain the genus *Cleistostoma* for de Haan's *Cleistostoma dilatata*.

As regards *C. tridentata*, A. Milne-Edw., from Upolu, I do not venture to decide whether this species ought to be referred to *Cleistostoma* as restricted by me or not.

80. Dioxippe orientalis, n. sp. (Pl. IX. figs. 8–10.)

Seventeen specimens were collected in the Mergui Archipelago; all are males, except one single ova-bearing female.

Dioxippe orientalis is probably somewhat allied to *Scopimera inflata*, A. M.-Edw., from the Indian seas ('Journal des Museum Goddefroy,' Heft iv. 1873, p. 7); but this form is certainly different, because the anterior legs are described as being minutely granular, and the absence of the "tympana" is not mentioned by the learned author. Our *Dioxippe* is of small size, like the species of *Dotilla* and *Scopimera*, and resembles to a certain extent some of the species of *Helœcius*, e. g. *H. inornatus*, Dana.

As in *Dotilla*, the cephalothorax is more enlarged above the bases of the legs than at its upper surface; and it is rather thick, though not globose. The upper surface is broader than long, the proportion of the greatest width, which is found a little behind the middle, being to the length (the front included) as 7 : 5. The upper surface is rather flattened, being only slightly declivous towards the front, towards the postero-lateral angles and behind a straight elevated transverse line which proceeds at a short distance from, and parallel to, the posterior margin between the bases of the last pair of legs. The posterior margin is slightly concave in the middle, and its lateral angles are rounded.

The upper surface is smooth and almost glabrous, presenting only a few scattered short cilia on the postero-lateral regions; the remarkable grooves of the genus *Dotilla* are quite wanting. Besides the broad, though shallow, longitudinal median furrow of the front, some interregional grooves are faintly indicated. Thus an impressed transverse line, interrupted in the middle, lies quite on the middle of the cephalothorax, and this I regard as the ordinary transverse groove which separates the gastric from the cardiac region; behind this groove a second is sometimes observed, situated as far from the transverse line above described as the latter is distant from the posterior margin of the cephalothorax. This second impressed line is apparently that which separates the anterior cardiac region from the posterior. The branchiocardiac grooves are shallow and very faintly marked. Though the upper surface is smooth and flattened, it appears, however, somewhat uneven on the branchial regions, owing to the occurrence of four or five small prominences, the posterior of which is a little more distinct than the others, and assumes the character of a small short transverse tubercle lying close to the base of the legs of the last pair, near the postero-lateral angles of the upper surface. Two slight transverse prominences are also observed on the anterior cardiac region.

The front is a little broader than in the species of the genus *Dotilla*, measuring between the eye-peduncles about a fourth of the distance between the external angles of the orbits. The anterior margin is slightly triangular, being a little prominent and subacute in the middle, whereas the lateral angles are rounded. The front is rather much declivous, and presents a broad, though shallow, longitudinal median furrow. The orbits are transverse and a little oblique; and the eye-peduncles, which are somewhat thickened at the cornea, are as long as the orbits. The upper margin of the orbits, which is finely ciliated, is smooth, entire, and a little raised upward, and the external angle is obtuse and not prominent. The lateral margins of the upper surface are slightly divergent posteriorly, and terminate nearly between the bases of the fourth and fifth pair of legs, being somewhat deflexed downward; their anterior half appears rather concave and their posterior slightly convex; so that the greatest width of the upper surface is found behind the middle. The lateral margins are slightly raised upwards along their anterior half, and present a small emargination immediately behind the obtuse external orbital angle, without forming, however, an epibranchial tooth. The lateral margins are shortly ciliated. The external antennæ are short, scarcely reaching to the cornea of the eye-peduncles. The inferior margin of the orbits is smooth and entire, and terminates laterally in a triangular, obtuse, thickened, much prominent lobe, which constitutes the external angle of the infraorbital margin. In those species of the genus *Dotilla* that I have examined, such as de Haan's *Scopimera globosa*, this lobe is quite absent, the external angle of the infraorbital margin being not at all prominent; and this different structure of the orbits changes so much the general outer physiognomy of this species, that I was induced by it to regard this form as the representative of a new genus. The short ciliated external margin of the orbits, which unites the external angles of the supraorbital and infraorbital margins, presents a triangular hiatus close to the external angle of the supraorbital margin. The pterygostomian regions and the other inflected sides of the cephalothorax are smooth, not sulcate, and rather thinly covered with short hairs; as in the genera *Gelasimus* and *Helæcius*, a ciliated line is found on the lateral surface of the cephalothorax, proceeding from the middle of the lateral margins towards the bases of the legs of the penultimate pair. The smooth, short, and narrow epistome is slightly more prominent than the front. The anterior margin of the buccal cavity presents a triangular equilateral prominence in the middle as in *Dotilla*, and a small narrow incision at each lateral angle.

The external maxillipeds closely resemble those of the genus *Dotilla*; but their merus-joints are quite smooth and ungrooved. They meet along their inner margins, which are a little hairy. The ischium-joint is quadrangular, scarcely broader than long;

its outer surface is smooth, and presents an arcuate piliferous line, proceeding from the middle of the external margin towards the internal half of the anterior margin. The latter, which forms the commissure between the merus-joint and the ischium-joint, is transverse (not oblique, as in *Scopimera globosa* and *S. tuberculata*) and straight, though a little concave towards the internal angle, which projects slightly more forward than the acute external angle. The internal and external margins of the ischium-joint are also slightly concave. The merus-joint is a little longer than the ischium-joint, and presents the same form as in the genus *Dotilla* (*sensu stricto*). The external and internal margins are arcuate, convex, and convergent anteriorly, so that the anterior margin of the joint is very short; this anterior margin is slightly concave, and bears the palpus near the external angle. Except a narrow, shallow, longitudinal impression which proceeds close and parallel to the external margin, the outer surface of this joint appears quite smooth, and without any trace of the grooves that characterize the species of *Dotilla*.

The male abdomen is narrow, and is similar to that of some other species of this group, the fifth (or antepenultimate) joint being much constricted near its base. The very short first segment occupies a little more than half the width of the sternum between the bases of the last pair of legs; the second segment is a little less broad, but slightly longer; the third segment is the broadest of all, being a little broader than the first, slightly longer than the first two joints taken together, and its lateral margins are arcuate; the fourth is as long as the third, but a little less enlarged; the fifth joint is about once and a third longer than the fourth, and a little narrower, and presents a characteristic constriction near the base; the sixth or penultimate joint is a little longer and broader than the fifth, and almost quadrate; while the terminal joint is as long as the fifth, and rounded at the tip. The lateral margins of the abdomen are fringed with short hairs; its outer surface, like that of the sternum, is quite smooth and glabrous. The female abdomen presents the ordinary form.

The anterior legs of the male are equal or sometimes rather unequal. They are similar to those of *Helœcius*; but the fingers have acute tips. The chelipedes are large and long, measuring about three times the greatest width of the cephalothorax. The basipodites and ischiopodites are smooth and unarmed.

The arms project slightly beyond the upper surface of the cephalothorax, and are trihedrous; their three margins are minutely granular; the inner surface and the anterior surface are smooth, but the outer presents a few scattered granules. The internal surface is slightly concave, the other two are flattened and even. As in *Dotilla myctiroides*, the carpopodite is elongate, being about as long as the length of the cephalothorax; its upper surface has an elongate-rhomboidal form. The carpopodite has wholly smooth upper, inner, and under surfaces, which are separated from one another by minutely granulated margins; it is armed at its internal proximal angle with a strongly compressed, though rather obtuse, tooth. *Scopimera inflata* is also described as being armed with a spine on the carpopodite of its anterior legs. Immediately behind this compressed tooth a small tuft of short hairs is observed, and the slightly convex upper surface of the wrist presents a small impression at the internal proximal angle close to this tooth. The hands (fig. 10) are similar to those of *Helœcius*. They are about once and a half as long as the distance of the external orbital angles, and nearly three times as long as the greatest width (height) of the palm, the fingers being included. The fingers are shorter than the palm; for they are in proportion to the length of the latter as 3½ : 5½. The slightly convex outer surface of the palm is quite smooth and glabrous; it is marked, however, with a longitudinal minutely granulated line running close and parallel to the flattened under margin, upon the outer surface of the immobile finger, close to its tip. The under margin of the palm is bordered and separated from the smooth, or nearly smooth, convex inner surface by a second longitudinal, minutely granulated line, which is continued along the inferior margin of the immobile finger. These two minutely granulated lines are nearly parallel. The fingers are quite smooth on their outer and inner surfaces. The mobile finger, however, presents a minutely granulated line along its upper margin, and, as I have already remarked, the outer surface of the immobile finger is marked with a similar line proceeding upon it from the outer surface of the palm; and its inner surface presents also a minutely granulated line continued to the tip. The lower finger is nearly in a straight line with the under margin of the palm, being scarcely or not at all deflexed. The sharp inner edges of the fingers are minutely crenulate along their whole length; the inner edge of the mobile finger is, moreover, a little prominent along its proximal half, presenting a low longitudinal tooth, which is a little more coarsely crenulate at its base. The inner edge of the immobile finger does not present such a tooth or prominence, but a small incision quite at the base. The tips are acute, pointed, and slightly curved, crossing one another when closed.

The ambulatory legs are rather slender, and resemble those of the species of the genus *Helœcius*. Those of the third pair, the antepenultimate legs, are the longest; those of the last pair the shortest of all. The meropodites are strongly compressed and flattened on their upper and under surfaces, and do not present the remarkable "tympana" of *Dotilla* and *Scopimera*; in the latter the tympana constitute oval impressions which are bordered by a wall of the more elevated portion of the surface of the joint. A histological examination of the legs might nevertheless prove their existence also in our *Dioxippe*; for when studying the upper surface of these joints by means of a magnifying-glass I observed oval lines bordering the central flattened part. The meropodites have minutely granulated upper and under margins, but are for the rest unarmed. The other joints are smooth and unarmed; the propodites are also compressed. The dactylopodites are a little shorter than the propodites, are laterally compressed, and acute. The ambulatory legs are also nearly glabrous; the dactylopodites are, however, a little hairy along their margins, and the legs of the second and third pair present a dense hairy down at the articulation of their carpopodites with the propodites, along the upper margins and on the upper and the under surfaces of these joints.

Dimensions of the largest male specimen:—

	millim.
Length of the cephalothorax (without the epistome) ..	4⅚
Distance between the upper external orbital angles ..	6¼
Greatest width of the upper surface of the carapace ..	6⅚
Length of the anterior legs........................	21
Length of the hands	8¾
Height of the palm	3⅕

The greatest width of the upper surface of the cephalothorax of the ova-bearing female is scarcely 5 millim.

Genus METOPOGRAPSUS, *M.-Edw.*

81. METOPOGRAPSUS MESSOR, *Forsk.* (Pl. IX. fig. 11.)

Cancer messor, *Forsk l, Descript. Animal. etc.* p. 88.

Grapsus messor, *Milne-Edwards, Hist. Nat. Crust.* ii. p. 88.

Metopograpsus messor, *Milne-Edwards, Ann. Sci. Nat.* 3 série, t. xx. p. 165.

Grapsus (Pachygrapsus) æthiopicus, *Hilgendorf, Crustaceen von Ost-Afrika, in Baron v. d. Decken's Reisen*, p. 88, Taf. iv. fig. 2.

Metopograpsus messor, *Hilgendorf, Monatsber. d. K. preuss. Akad. d. Wiss. Berlin*, Nov. 1878, p. 808; *Miers, Crustacea of Rodriguez*, p. 5.

Two specimens were collected at Elphinstone Island.

We are indebted for a very good figure of this species to Dr. Hilgendorf, who erroneously described and figured *Metop. messor* as a new species, under the name of *Grapsus æthiopicus*. The two Mergui specimens fully agree with his figure. The proportion of the distance between the external orbital angles to the length of the carapace (the front included) is as 30 : 22 in the male of this species, the cephalothorax being more enlarged than in *M. maculatus* and *M. pictus*. The front is comparatively a little less enlarged than in *M. maculatus*, the proportion of the distance between the external orbital angles to the breadth of the front (measured between the eye-peduncles) being in *M. messor* as 30 : 19, but in *M. maculatus* as 30 : 20.

The anterior margin of the front is feebly sinuated in the middle, exactly as figured by Hilgendorf, *l. c.* fig. 2 *b*.

The form of the male abdomen also agrees with that figure, though the penultimate joint in the Mergui specimens appears a little longer in proportion to its breadth.

The hands are somewhat unequal; their outer surface is very convex and appears perfectly smooth, though a little minutely punctate (when seen under a magnifying-glass), except at the upper margin and near the articulation with the wrist. The upper margin of the palm is slightly tubercular and rugose; close to the articulation with the wrist and at the under margin a few oblique, scarcely elevated lines occur on the outer surface of the hand; a similar line, nearly parallel and close to the under margin, proceeds on the outer surface of the palm as far as the middle of the index. The outer surface of the fingers is perfectly smooth and minutely punctate, when seen under a magnifying-glass; and they have somewhat excavated horny tips.

The upper surface of the thumb, which in these specimens appears a little more arcuate than in the figure 2 *c* of Hilgendorf, is minutely tubercular, especially near the inner surface, nearly to the tip. The inner surface of the palm presents on its proximal half some rugose lines, which are parallel to the posterior margin, and the inner surface of the index is a little granular at the base.

Metopograpsus messor has been found in the Red Sea, throughout the whole Indian Ocean (Zanzibar, Persian Gulf, Nossy-Faly, coast of Malabar, Mauritius), in the Malayan Archipelago, and extending from Australia to the Fiji Islands, New Caledonia, and the Sandwich Islands.

82. METOPOGRAPSUS MACULATUS, *H. M.-Edw.* (Pl. X. figs. 1–3.)

Metopograpsus maculatus, *H. Milne-Edwards, Ann. Sci. Nat.* 3^e série, t. xx. p. 165.

Four specimens were collected in the Mergui Archipelago, one male and three females.

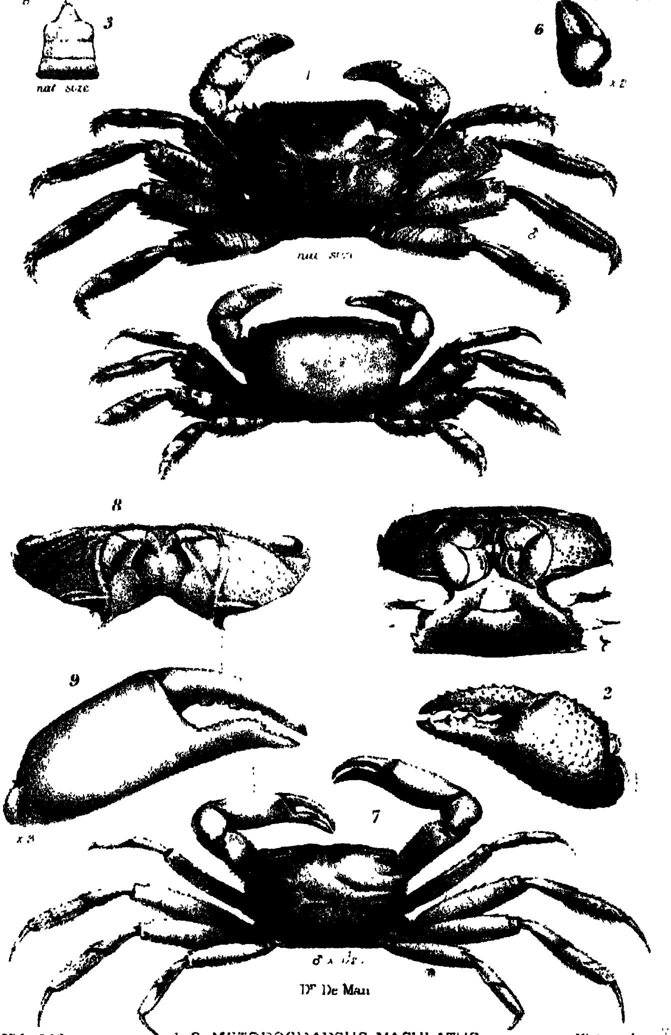
This species is still very imperfectly known, for so far as I am aware no other description has been published since its first diagnosis, given by the late H. Milne-Edwards. Prof. A. Milne-Edwards, to whom I had sent the male individual of this collection, informed me that it was *M. maculatus*, M.-Edw., as I had inferred. I will therefore point out some characters of this *Metopograpsus* and compare it with *M. messor*, Forskål, and *M. pictus*, A. M.-Edw., the latter of which occurs in the seas of the Moluccas and on the shores of New Caledonia.

With respect to the general shape of the cephalothorax, *M. maculatus* appears quite intermediate between the two above mentioned species of this genus, as regards the proportion between the length and the breadth of the carapace. The cephalothorax of *M. maculatus* is somewhat less enlarged and somewhat more elongate than that of *M. messor*; in the male specimen from Mergui being even more slightly enlarged anteriorly than in the typical specimens from Java, described by the late H. Milne-Edwards. As Prof. A. Milne-Edwards informs me, the proportion of the distance between the external orbital angles to the length of the carapace is as 30 : 23 (in *M. messor* as 30 : 22).[1] The carapace of *M. pictus* is much more elongate than that of *M. maculatus*.

As I have already observed, the front is a little more enlarged in this species than in *M. messor*, and measures exactly two thirds of the distance between the external orbital angles, both in the male and in the female. Its anterior margin appears nearly straight, and is minutely denticulated along its whole breadth, the minute granules being, however, a little larger towards the angles. Like *M. messor*, the front is much declivous, but the postfrontal lobes are still less prominent, though resembling those of that species. On each side of the middle three lobes may be distinguished, but, as in *M. messor*, the two external ones of each side are scarcely separated from one another, often appearing rather confluent. They are a little granular, but never present the transverse rugose lines which occur on the postfrontal lobes and on the gastric region of *M. messor*. Except the postfrontal lobes, the whole upper surface of the carapace of *M. maculatus* appears everywhere smooth and bright, presenting nearly the same interregional grooves which occur in *M. messor* and *M. pictus*, and they are likewise minutely punctate, especially on the postero-lateral regions, when seen under a lens. In both species the postero-lateral regions are provided with many oblique, elevated lines near the lateral margin. The male abdomen presents a form distinct from that of *M. messor*. The terminal joint is comparatively much smaller, triangular, and nearly as long as broad at its base; the penultimate is nearly twice as broad as the breadth of the base of the terminal joint, has rounded antero-lateral angles, and is even a little broader than the fifth joint. The terminal and penultimate joints have the same length, whereas in *M. messor* the former is a little longer than the latter. In the latter species the abdomen has rather a triangular form, the sides converging towards the tip of the terminal segment; but in *M. maculatus* the sides of the abdomen, except the terminal segment, are nearly parallel to one another.

The chelipedes and ambulatory legs of this species present a remarkable resemblance to those of *M. pictus*, but differ from those of *M. messor* by several characters.

The chelipedes are somewhat unequal, both in the male and in the female. The arms much resemble those of the two other species. Their acute upper margin is transversely rugose; the anterior margin is armed with five or six small obtuse tubercles along its proximal half and is dilated anteriorly into a crest, which is armed with some acute teeth. The under margin of the



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1–3. METOPOGRAPSUS MACULATUS.
4–6. PYXIDOGNATHUS DEIANIRA. 7–9. METAPLAX DISTINCTUS.

arm is also tuberculiferous, and armed at its distal end with a short acute spine (as in *M. messor*). The outer surface of the wrist is transversely rugose and covered with some small, more or less acute tubercles, also at the internal angle. The hands (Pl X. fig. 2) are a little more elongate (less high) than those of *M. messor*, and differ at first sight by their outer surface being never smooth. The proximal half of the outer surface is covered with many short, oblique, elevated lines, which gradually change towards the fingers into minute granules. As in *M. messor*, an elevated line, nearly parallel to the rounded and rugose under margin of the hand, proceeds towards the base of the immobile finger The rounded upper margin is covered with numerous small acute tubercles, and the convex inner surface of the hand is granular. The fingers have slightly excavated horny tips, and their somewhat punctate external surface is smooth, but slightly granular at the base; the thumb appears to be somewhat more slender than that of *M. messor*, and its upper surface also is covered with small acute tubercles, which, however, are more numerous and somewhat larger than in that species. The under surface of the index is also somewhat tubercular.

The ambulatory legs present a striking resemblance to those of *M. pictus*, figured in the 'Nouvelles Archives.' In *M. messor*, on the contrary, the penultimate joints (or propodites) are comparatively much less elongate.

M. latifrons, White, is probably identical with *M. maculatus*, and in that case has the priority.

Dimensions:—

	♂. millim.	♀. millim.
Distance between the external orbital angles.	29	27
Length of the carapace (the front included) .	22¼	21½
Breadth of the front (measured between the eye-peduncles)	19½	18¼
Length of the propodites of the third pair of ambulatory legs, measured in the middle of the joint	18½	13

Metopograpsus maculatus has hitherto been recorded from Batavia (*Milne-Edwards*); and specimens of this species in the Leyden Museum were collected on the coast of Java.

Genus GRAPSUS, *M.-Edw.*

83. GRAPSUS STRIGOSUS, *Herbst.*

Cancer strigosus, *Herbst, Krabben und Krebse*, pl. xlvii. fig. 7.

Grapsus strigosus, *Milne-Edwards, Hist. Nat. Crust.* t. ii. p. 87, and *Ann. Sci. Nat.* t. xx. p. 169.

Grapsus strigosus, *Alph. Milne-Edwards, Nouv. Arch. du Muséum Hist. Nat.* 1873, t. ix. p. 286, with the quoted synonyms.

Six specimens (3 ♂, 3 ♀) were collected, namely, four in Elphinstone Island and two in French Bay, King Island.

Grapsus strigosus occurs in the Red Sea, the Indian Ocean (Mozambique, Ceylon, Nicobar Islands), the Malayan Archipelago (Sumatra, Celebes, Timor, Amboina), Australia, China (Hongkong), the Loo-choo Islands and New Caledonia. It is said to occur on the coast of Chili.

Genus PACHYGRAPSUS, *Stimps.*

84. PACHYGRAPSUS MINUTUS, *Alph. M.-Edw.*

Pachygrapsus minutus, *Alph. Milne-Edwards, Nouv. Arch. du Muséum Hist. Nat.* 1873, t. ix. p. 292, pl. xiv. fig. 2; *de Man, Notes from the Leyden Museum*, vol. v. p. 158.

One male specimen was collected at Owen Island, completely agreeing with the first description and the figure.

The distance between the external orbital angles measures 10 millim.

As this small species has been observed also in the Banda sea and on the coast of New Caledonia, it would appear to be distributed throughout the whole Malayan Archipelago.

Genus PYXIDOGNATHUS, *Alph. M.-Edw.*

85. PYXIDOGNATHUS DEÏANIRA *, n. sp. (Pl. X. figs. 4–6.)

Prof. A. Milne-Edwards some years ago established the genus *Pyxidognathus* for a small crustacean, living in fresh or somewhat brackish water in the island of Ovalau (Bulletin de la Soc. Philom. de Paris, Dec. 1878). I described, three months afterwards, a remarkable species in the Leyden Museum, under the name of *Hypsilograpsus Deldeni*, n. g. et sp., which was found near Manado, in the island of Celebes (Notes from the Leyden Museum, vol. i. p. 72, 1879); and I subsequently recognized the form as being probably identical with Milne-Edwards's *Pyxidognathus granulosus* (Notes from the Leyden Museum, 1883, vol. v. p. 159).

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* *Deïanira*, one of the Nereids.

The Mergui Collection, which presents so large a number of interesting species, contains three specimens, namely, a probably adult female and two much younger males, which were collected in mangrove-swamps. These specimens apparently belong to a species hitherto unknown, which I refer to the genus *Pyxidognathus* *.

This species presents the same remarkable and rare structure of the outer foot-jaws as the genera *Ptychognathus*, Stimps. (*Gnathograpsus*, A. M.-Edw.), and *Pyxidognathus*, M.-Edw., and, moreover, agrees in many other characters with the representative of the latter genus. *Pyxidognathus Deianira* may, however, be distinguished at first sight from *Pyxidognathus granulosus* (and thus also from *Hypsilograpsus Deldeni*) by the upper surface of the cephalothorax being smooth and glabrous, and presenting no other interregional grooves than the median transverse portion of the cervical suture.

The cephalothorax is broader than long, the proportion of the breadth to the length being about as 4 : 3; *P. granulosus* also presents the same proportions The cephalothorax is not extraordinarily thick. The carapace is nearly as broad anteriorly as posteriorly, and the lateral margins are scarcely arcuate; the upper surface is much convex anteriorly, declivous towards the lateral margins, and the front is strongly deflexed. The whole upper surface appears smooth to the naked eye; but when examined with a magnifying-glass, it shows everywhere minute punctations, a few larger being seen on the front and near the antero-lateral margins. It is only near the postero-lateral margins that the upper surface is slightly and minutely granular. The median part of the cervical suture and the branchio-cardiac grooves are very faintly indicated; all the other interregional grooves are completely wanting, and the upper surface appears smooth and convex.

The front is considerably deflexed; and is situated between the internal orbital angles, which are as prominent as the front; the distance between the angles measuring about a third of the breadth of the cephalothorax. The front is separated, on each side, from these triangular internal orbital angles by a small emargination, and is scarcely sinuated in the middle. Only a trace of the usual mesial frontal furrow is visible.

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* *Cœlochirus crinipes*, Nauck, and *Pachystomum philippinense*, Nauck (1880), are identical, the former with *Ptychognathus pilipes*, A. M.-Edw., the latter with *Pseudograpsus albus*, Stimps. (de Man, in Zoolog. Jahrbücher, herausgeg. von Prof. J. W Spengel, Jena, Bd. ii. p. 719, 1887).

As already observed, the lateral margins are scarcely arcuate. The antero-lateral margins are a little shorter than the postero-lateral and armed with three acute teeth. The first tooth, or external orbital angle, is rather acute and prominent, and about as large as the two following teeth together; the second tooth, only half as large as the first, is acute and directed straight forward, and the third is the smallest of all and also acute. The antero-lateral teeth are separated from one another by rather deep, though narrow, incisions. The external margin of the last antero-lateral tooth is prolonged backward, as a minutely granulated line defining the postero-lateral margin.

The external antennæ are short, scarcely reaching to the external angles of the orbits; their peduncle occupies the internal canthus of the orbits. The first or basal joint scarcely reaches the internal orbital angle, the second is the longest of all, and the third is again a little shorter than the second. The internal suborbital lobe is small and little prominent. The inferior margin of the orbits is minutely crenulate and does not unite with the external orbital angle, so that the orbits are not completely closed externally, as in the genera *Metaplax*, *Cyclograpsus*, &c. The pterygostomian regions and the inflected sides of the cephalothorax are covered with some small granules and are a little hairy. The epistome is short and enlarged; the minutely granulated anterior margin of the buccal cavity is broader anteriorly than posteriorly, and its lateral margins are arcuate, and being slightly emarginate on each side of the middle, it presents three rounded lobes. The external maxillipeds are a little gaping; the ischium-joint is scarcely twice as long as broad, its internal margin is slightly convex, its external slightly concave. The merus-joint is a little shorter than the ischium-joint and strongly auriculated, the external distal angle being much prolonged transversely outwards. The palpus is inserted on the anterior margin of the merus-joint, its distance from the obtuse internal angle being a little less than its distance from the rounded external angle; between the point where the palpus is inserted and the obtuse internal angle, the anterior margin of the joint is slightly emarginate. The exopodite (exognathe, A. M.-Edw.) is extremely enlarged, being much broader in the middle than the ischium-joint, and it does not reach to the anterior margin of the merus-joint; it is broadest in the middle and considerably narrower at the anterior extremity. The outer surface of the joints of the external maxillipeds is punctate; both the merus- and ischium-joints are marked with a longitudinal ridge on their outer surface, running close and parallel to the internal margins. The outer surface of the exopodite is convex.

The abdomen of the male is rather narrow, and its lateral margins are nearly parallel, scarcely converging towards the terminal end. The two basal joints do not occupy the whole width of the sternum between the bases of the legs of the last pair. The third and fourth joints are nearly three times as long as broad, and have the same length; the fifth and the sixth are as broad as the two preceding joints, and are successively a little longer; the terminal joint is rounded at the tip and its posterior margin is nearly as broad as its length. The female abdomen is much broader than that of the male and fringed, along the lateral margins, with hairs; the lateral margins of the joints are slightly arcuate. The outer surfaces of the sternum and of the abdomen are slightly punctate.

The chelipedes of the largest specimen (♀) are somewhat unequal, the left leg being slightly the larger. The ischiopodites are armed with two or three minute acute tubercles on their anterior margin. The arms scarcely project beyond the lateral margins of the cephalothorax; their outer surfaces are somewhat transversely rugose, and the margins are covered with some more or less acute granules. The upper surface of the wrist is covered with some minute granules, a few larger ones being found near the internal margin; the internal angle of the wrist is armed with a small acute tooth, and one or two smaller teeth are found immediately below it. The larger hand is scarcely twice as long as high, and the fingers are nearly as long as the palm; the latter has a tolerably convex outer surface and the under margin is also convex. The outer surface, which appears smooth to the naked eye, is marked below with a rather coarsely granulated or minutely denticulated longitudinal line, proceeding close and parallel to the under margin of the palm, to the tip of the immobile finger. One or two minute acute tubercles or granules are found on the outer surface near the middle of the distal margin of the palm, *i.e.* a little below the articulation of the mobile finger. The upper margin and the slightly convex inner surface of the palm also present some granules. The fingers are spoon-like, excavated at their horny tips, and are scarcely gaping; the mobile finger is nearly straight, and its surface is minutely punctate, but otherwise smooth and ungrooved. The outer surface of the index is also smooth, and both fingers are slightly denticulate, the inner edge of the mobile finger presenting four small teeth, that of the index three, which are a little larger. The smaller hand resembles the larger, but the fingers are comparatively a little longer.

The chelipedes of the two young male specimens are equal to one another, and present the same form and structure as those of the adult female.

The ambulatory legs of the second pair are the longest of all, being twice as long as the length of the carapace, those of the last pair are the shortest, and those of the first and third pairs have an intermediate length. The meropodites are scarcely enlarged, and their outer surfaces are minutely granular; their upper margins are minutely denticulate and armed at the distal end with a short acute spine, which is, however, probably wanting on the upper margins of the meropodites of the last pair. The under margins of the outer (upper) surface of the meropodites are armed with a strong acute spine a little before the distal ends; and the meropodites of the last three pairs, moreover, present two or three smaller spines between the large spine and the distal end of the under margins. The under margins of the internal or under surfaces of the meropodites of the last pair of ambulatory legs are armed with two or three acute spines at the proximal end; these spines are not found on the meropodites of the other ambulatory legs. The propodites, which are a little longer than the carpopodites, are armed with a short acute spine at the distal end of their under margins. The scarcely arcuate dactylopodites are hardly shorter than the propodites: they are depressed, unarmed, terminate in an acute horny tip, and are covered with four rows of minute bristles. The three terminal joints of the ambulatory legs are densely hairy along their upper and under margins.

Dimensions of the largest specimen (♀):—

	millim
Breadth of the cephalothorax (measured at the last antero-lateral teeth)	12⅓

	millim.
Length of the cephalothorax	9
Distance between the external orbital angles	10½
Distance between the internal orbital angles	4⅗
Length of the larger hand	7¼

Genus METAPLAX, *M.-Edw.*

(Syn.: Rhaconotus, *Gerstaecker*, 1856.)

The genus *Metaplax* was established in 1852 by the late H. Milne-Edwards for two small Brachyura from the Indian Ocean. This celebrated carcinologist referred it to his section *Gonoplaciens*, and considered it as making a transition between the genera *Macrophthalmus*, *Gonoplax*, and *Helice*. Four years afterwards, Gerstaecker described an interesting new form of *Sesarmacea* under the name of *Rhaconotus crenulatus*. Surprised by the extraordinary length of the legs, he was unable to refer his new species to any one of the genera of *Sesarmacea* enumerated by Milne-Edwards, and not observing its close affinity to the genus *Metaplax*, he founded a new genus *Rhaconotus*.

In 1858 Stimpson published a new species of *Metaplax*, discovered at Hongkong.

In 1865, Heller, the author of the Report on the Crustacea collected during the Novara Expedition, described a young female specimen of Brachyura from Ceylon under the name of *Helice dentipes*.

The Mergui Archipelago contains not only representatives of one of the two species of *Metaplax* described in 1852, but even two new species of this group, and moreover a fine series of specimens of the rare *Rhaconotus crenulatus* and of Heller's *Helice dentipes*.

A careful examination of these five species has led me to the conclusion that they are all closely allied to one another, and ought to be referred to the same genus, and that this genus is most closely allied to *Helice*, de Haan.

When comparing them with one another, and with the typical representative of *Helice*, the Japanese *Helice tridens*, de Haan, it is not difficult to observe that these species are all closely allied, or even agree with one another as regards the structure of the cephalothorax, that the very different appearance of *Rhaconotus crenulatus* and *Helice tridens* must be chiefly ascribed to the thicker cephalothorax of the latter and to the different form of the chelipedes; and finally that a gradual transition is formed between them by the shape of the anterior legs of the four other species.

I may call attention to a short, horny, longitudinal crest, characteristic of the male, and found on the upper (=inner) surface of the arm of the chelipedes, lying parallel and close to, or even on, the anterior margin of it, which I propose to call the "musical crest." This crest is found in the genera *Metaplax* and *Helice*, and in some species of *Macrophthalmus* (*e. g.* in *M. tomentosus*, Eyd. & Soul.). I suppose that musical sounds are produced by the crab rubbing this crest along the row of lobules, teeth, or granules situated on the inferior margin of the orbits, which I shall name "the infraorbital ridge."

In all species of *Metaplax* and *Helice* the inferior margin of the orbits is provided with lobules or teeth; these lobules or teeth do not occupy the whole inferior margin of the orbits, but the ridge on which they stand leaves the margin at a small distance from the external angle. In the male this infraorbital ridge is prolonged backwards, parallel to the lateral margin of the cephalothorax, to some distance behind the orbits, so that we may distinguish an "orbital portion" of the infraorbital ridge from a "postorbital portion." In the female, however, at least of those species which I have been able to examine, the infraorbital ridge is never prolonged behind the orbits, and its teeth or lobules are always smaller than in the male.

The genus *Metaplax* belongs to the group of *Sesarmacea* in the close vicinity of *Helice*, and it presents the following characters:—

Cephalothorax broader than long, rather thin and little convex above. Lateral margins toothed. Front little deflexed, rather narrow, measuring about a third or a fourth of the breadth of the cephalothorax, with oblique lateral margins, and less prominent than the epistome. External maxillipeds widely gaping, with an oblique piliferous ridge; merus-joint as long as, or scarcely longer than broad, and about as large as the ischium-joint. As regards the structure of the orbits, of the pterygostomian regions, and of the inflected sides of the cephalothorax, also as regards the shape of the sternum and of the abdomen, the genus *Metaplax* perfectly agrees with *Helice*, de Haan, though the pterygostomian regions and the inflected sides of the carapace are generally less densely reticulate.

The chelipedes of the male are, in most species, more or less elongate, the palm being nearly always longer than broad. Arms of the anterior legs of the male with "musical crest." Ambulatory legs similar to those of *Helice*, those of the penultimate and antepenultimate pair being equal in length, and much longer than the legs of the second and fifth pair.

Though this genus is closely allied to *Helice* I am, however, inclined to retain it, including in the genus of de Haan (the type of which is *Helice tridens*) those species which have the cephalothorax rather thick and more or less convex above, and the chelipedes short, with the palm higher than long. The genus *Metaplax*, on the other hand, may contain those species with a thinner and more depressed cephalothorax, which have the anterior legs more or less elongate, and the palms of the hands longer than high.

The genus *Paragrapsus*, M.-Edw., of which I have been enabled to examine two species through the kindness of Prof. A. Milne-Edwards, is also closely allied to *Metaplax*, but differs by the front being much more prominent than the epistome.

The genus *Metaplax*, as now defined, includes seven species, all of which inhabit the Oriental seas; five are described in this Report, the other two being *Metap. indicus*, M.-Edw., and *Metap. longipes*, Stimps., from Hongkong.

The five species of this collection may be distinguished thus:—

Carpopodites and propodites of the ambulatory legs	spinulose along the upper or anterior margins………			*crenulatus.*
	not spinulose along the upper or anterior margins. Number of lobules or teeth of the infraorbital ridge in the male amounting to	25–30.	Lobules of the orbital portion very large, 6 in number in the adult male, and rapidly decreasing in size ……	*dentipes.*
			Lobules of the orbital portion small, 10–12 in number, and slowly decreasing in size ……	*distinctus.*
		40–60. Palm of the hands of the male	longer than broad …………	*elegans.*
			as long as broad …………	*intermedius.*

86. **METAPLAX CRENULATUS**, *Gerst.*

Rhaconotus crenulatus, *Gerstaecker, Carcinologische Beiträge, Archiv f. Naturgeschichte,* Jahrg. xxii. 1856, p. 142, Taf. v. fig. 5.

The collection contains a fine series of eleven specimens (8 ♂, 3 ♀) of this rare crustacean*.

The following may be added to Gerstaecker's description.

The granulated anterior margin of the buccal cavity is more prominent than the front, as in *Helice*, so that it is distinctly visible when the carapace is viewed from above. This margin presents a small emargination on each side close to the external angles, and the endostome is longitudinally ridged on each side. The widely-gaping outer foot-jaws are provided with an oblique piliferous ridge, and thus resemble *Helice* and *Paragrapsus*. The infraorbital ridge is continued backwards in the male nearly to the level of the middle of the second antero-lateral tooth; it is entire for a short distance, namely, from the inner angle to a little beyond the middle of the eye-peduncles, but thence appears finely crenulated to the posterior end; these granules, which gradually decrease in size backwards, are about 25 in number. In the female the ridge is not continued behind the orbits, and presents a row of about 25 minute, more or less truncated teeth along its whole length.

The male abdomen measures nearly a third of the breadth of the sternum; the first or terminal joint is triangular, nearly as long as broad at the base, and rounded; the second is much broader and longer, and almost quadrate, being scarcely broader than long; the three following joints gradually increase a little in breadth, decreasing in length; the sixth is extremely short and a little narrower than the fifth, and the seventh, or basal segment, is cristate, and occupies nearly the whole breadth of the sternum between the bases of the last pair of legs. The lateral margins of the abdomen are fringed with short hairs. The first or terminal segment of the female abdomen is partially pushed into the penultimate.

The chelipedes of both males and females are equal to one another; it is probable therefore that Gerstaecker's specimen, the right leg of which was much larger than the left, was an abnormal individual. In the male the chelipedes gradually appear more elongate, according to the greater age of the individuals: *e. g.*, in a small specimen, the cephalothorax of which is only 20 millim. broad, the chelipedes, being 30 millim. long, are one and a half times as long as the breadth of the carapace; the chelipedes of this specimen only project for a short distance beyond the lateral margins of the cephalothorax, the arms scarcely reaching to the distal end of the first third of the meropodites of the third pair of legs. In the largest specimen, on the contrary, the chelipedes are nearly two and a half times as long as the breadth of the cephalothorax, and they are very elongate, the arms reaching nearly to the distal end of the meropodites of the third pair of legs. The arms are triquetrous in the male, presenting an upper, an anterior, and a posterior surface; they are somewhat thickened near the proximal extremity, and also, although not so much, at the distal end. The "musical crest" is situated near to the proximal extremity of the anterior margin of the upper surface of the arm, and on the margin itself, so that it lies exactly opposite to the infraorbital ridge, against which it is moved and rubbed by the animal. In the female there is no trace of the musical crest.

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* *M. crenulatus* was not represented in the extensive collection of the Leyden Museum until 1882.

As already stated, the chelipedes are comparatively much shorter in young male specimens than in the adult. In a young individual, the cephalothorax of which is 20 millim. broad, the musical crest is placed on the middle of the anterior margin of the arm; so that at a still younger age it is probable that the crest is situated near the distal extremity of the arm (as in *Helice*), and that it gradually proceeds towards the proximal extremity, in consequence of the growth of that part of the arm lying between the crest and the distal extremity, the proximal part not increasing in length. In the same specimen the hands are less elongate than in the adult, and the fingers are a little longer than the palm, whereas the immobile finger is scarcely curved downward.

The female specimen, carrying eggs, is scarcely more than 20 millim. broad. Its chelipedes are equal, project but little beyond the lateral margins of the carapace, and are even smaller than those of the male specimen of equal size. The fingers are nearly once and a half as long as the palm.

Dimensions of the largest (male) specimen:—

	millim.
Length of the cephalothorax (distance from its posterior margin to the anterior margin of the buccal cavity)	28½
Breadth of the cephalothorax (distance between the second antero-lateral teeth)	37½
Breadth of the anterior margin of the front	8
Length of the chelipedes	90
Length of the hands (distance between the proximal extremity of the under margin of the palm and the tips of the fingers)	42
Length of the upper margin of the palm	27
Length of the ambulatory legs of the penultimate pair	90

The habitat of this rare and interesting species was hitherto unknown.

87. METAPLAX DISTINCTUS, *H. M.-Edw.* (Pl. X. figs. 7–9.)

Metaplax distinctus, *H. Milne-Edwards, Observations sur la classification des Crustacés, Ann. Sci. Nat.* 1852, p. 162, pl. iv. fig. 27.

Two fine male specimens were collected at Sullivan Island. The collection of typical specimens of the Paris Museum, kindly sent to me by Prof. A. Milne-Edwards, included two small, little-known forms, viz. *Metaplax indicus* and *M. distinctus*; unfortunately the type specimen of the latter had lost its chelipedes, but this species is very well characterized by the structure of its infraorbital ridge.

M. distinctus and the three following species of the present report differ at first sight from *M. crenulatus* by their smaller size, their more enlarged cephalothoraces, not narrowed anteriorly, by their less elongate legs, and by the ambulatory ones being spinulose only along the upper margin of their meropodites.

For the general appearance of the cephalothorax, I refer to the figure in the 'Annales des Sciences Naturelles,' which is exact. The upper surface is sparsely punctate, and the lateral margins are armed with four teeth (the external orbital angles included); these teeth are formed by three incisions, the anterior of which is rather deep, whereas the posterior two are much smaller. The first two teeth have almost the same size, and are much larger than the posterior two, the last being still smaller than the third. The lateral margins are fringed with short hairs, and the branchial regions of the upper surface are marked with three minutely granular lines, the anterior one of which is almost transverse, and terminates at the third antero-lateral tooth, whereas the other two proceed obliquely on the postero-lateral regions of the cephalothorax; the latter are slightly pubescent. The upper surface of the carapace is a little convex, and the front is declivous and longitudinally grooved in the middle. The anterior margin of the front, which presents a small triangular incision in the middle, the breadth of which measures somewhat more than a fourth of the distance between the external orbital angles, makes very obtuse angles with the lateral margins of the front.

The front is a little less prominent than the epistome, so that the latter is visible when the carapace is viewed from above.

The infraorbital ridge was described by Milne-Edwards as "finement crénelé;" but these words are only exact when *M. distinctus* is compared with *M indicus* In *M. indicus*, M.-Edw., the infraorbital ridge is prolonged backwards to the level of the *first* antero-lateral incision, and only presents nine or ten teeth or lobules of very unequal size. The first four or five teeth are very small, and slightly increase in size; they are followed by two large rounded lobules. Behind the latter, and separated from them by a larger interval, three smaller, rounded, postorbital tubercles occur, constituting the postorbital portion of the ridge, and gradually decrease in size backwards.

In *Metaplax distinctus*, on the contrary, the infraorbital ridge is continued backwards, behind the orbits, to the level of the second incision of the lateral margins of the carapace. In this species the ridge is composed of 25–30 small lobules, which successively, though slowly, decrease in size backwards. The first eight or ten lobules, which constitute the orbital portion of the ridge, are longer than broad, the following as long as broad, and the posterior fourteen or fifteen much smaller postorbital lobules are even a little broader than long. These small lobules are distinctly transversely sulcate on their upper margin.

As in all species of *Metaplax*, the outer foot-jaws are widely gaping and provided with an oblique piliferous ridge; the merus-joint is nearly quadrate, being about as long as broad, and has been very well figured by Milne-Edwards. The anterior margin of the buccal cavity is nearly straight, and does not present the deep lateral emarginations which occur in *M. crenulatus*. The pterygostomian regions are a little granular, and much resemble those of the latter species.

In the size and the form of the male abdomen this species agrees very well with the rare Crustacean described by Gerstaecker. All the joints are distinctly separated from one another, none of them being coalescent. The first (or terminal) joint is nearly quadrate and rounded anteriorly. The second is almost as long as the first, but much broader, the breadth of its posterior margin being in proportion to the length of the joint as 3½ : 2. The third joint is scarcely shorter than the second.

The anterior legs are almost equal to one another, and about twice as long as the breadth of the carapace. The arms project the distal half of their length beyond the lateral margins of the cephalothorax, and reach therefore to the middle of the meropodites of the legs of the third and fourth pairs. They are triquetrous, as in the preceding species, the anterior and the posterior surfaces being concave. The upper surface is a little curved, the minutely granular external or distal half making a very obtuse angle with the smooth internal or proximal portion. The latter part bears the musical crest, which is close to the anterior margin; and behind the crest is a longitudinal row of short hairs. The anterior margin of the upper surface of the arms is a little granular, five or six somewhat larger acute granules being found near the distal end. Some small acute granules are also seen along the middle of the posterior margin. The internal angle of the wrist is marked with some small acute granules.

The hands much resemble those of some species of *Macrophthalmus*, the palm being longer than broad, and the fingers deflexed downwards. They are nearly as long as the distance between the external orbital angles. The palm is a little more than once and a half as long as it is broad (high) at its distal end, the proportion of the length of the palm to its breadth at the articulation of the mobile finger being as 10½ to 6½. The fingers are half as long as the palm; the immobile finger is slightly deflexed, but the mobile is strongly curved downward.

The hands appear quite smooth to the naked eye, except at and near the upper margin of the palm and of the mobile finger, where they are minutely granular; when examined, however, under a lens, they seem to be covered everywhere with minute granules. The fingers have horny tips, which are slightly spoon-like excavated; the mobile finger is armed with many small teeth, the basal ones of which are somewhat larger than the others. The immobile finger, which is higher at its proximal than at the distal half on account of a prominent rounded lobe along the former, is armed with many small teeth, of which the basal ones are rather obtuse, those of the distal half being more acute.

The ambulatory legs much resemble those of *Metaplax crenulatus*, but they are less elongate and less spinulose. The legs of the second pair (= the first pair of ambulatory legs) and those of the fifth are nearly of equal length, and much shorter than the legs of the third and fourth pair, which are also equal in length. The meropodites of the legs of the second and of the fifth pair are armed with a single small spine at the distal end of the upper margin, but those of the third and of the fourth pair have a row of five or six acute spines along the distal half of the upper margin. The under margins of the meropodites present no spines, and the other joints of the legs are quite unarmed. The inferior margins of the distal ends of the meropodites of the legs of the third and fourth pair are hairy, and the carpopodites and the propodites of the same legs are also very hirsute, especially at and near their articulations.

Dimensions :—

	millim.
Breadth of the cephalothorax (distance between the second antero-lateral teeth)	16⅘
Length of the cephalothorax	11½
„ „ chelipedes	30
„ „ hand (the fingers included)	16
„ „ under margin of the palm	10½
„ „ legs of the penultimate pair	33

Metaplax distinctus has hitherto been recorded only from Bombay. It is one of the rare species of Brachyurous Crustacea.

88. **Metaplax dentipes**, *Heller*. (Pl. XI. figs. 1–3.)

Helice dentipes, *Heller, Crustaceen der Novara-Reise*, p. 62, Taf. v. fig. 5.

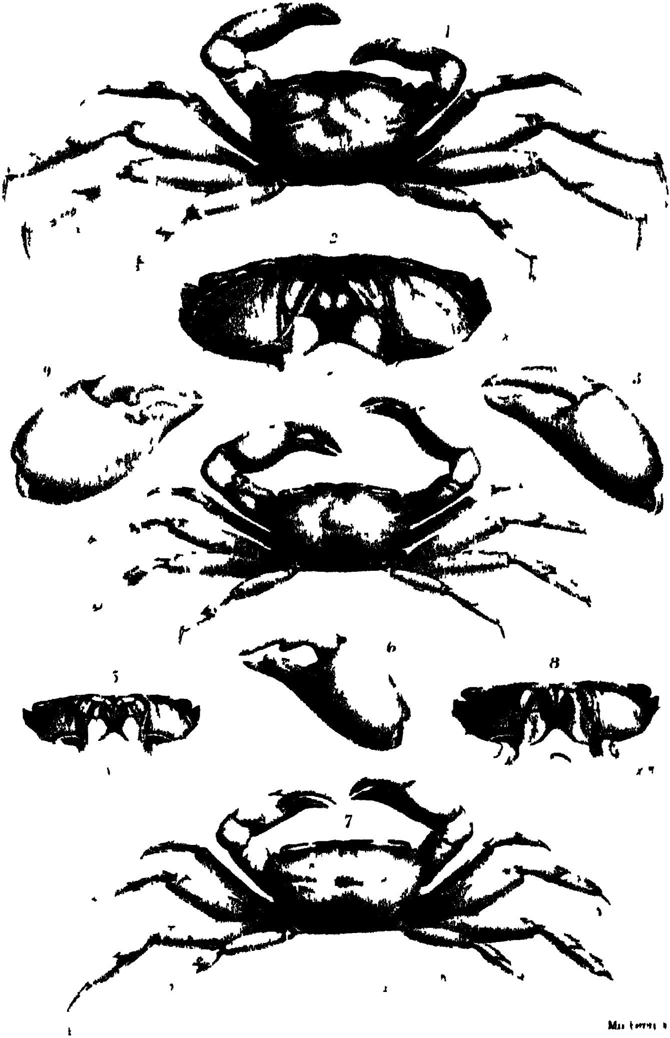
Helice dentipes, *Kingsley, Carcinological Notes*, no. iv. *Synopsis of the Grapsidæ, Proc. Acad. Nat. Sci. Philadelphia*, 1880, p. 220.

This species is represented by a fine series of thirteen specimens of various sizes, viz.: one adult male specimen, found at Tavoy, two young individuals from the Rangoon river, two younger individuals from a mangrove-swamp at Zediwon, and eight other specimens from the same locality.

This species has hitherto been very unsatisfactorily known, as only a young female specimen was described by Heller; the interesting characters of the male were unknown. The Mergui specimens, however, undoubtedly belong to Heller's *Helice dentipes*, which may be easily distinguished from the allied species by the less enlarged cephalothorax, by the structure of the infraorbital ridge, and by some other characters.

This species is closely allied to *Metaplax distinctus*, M.-Edw., the upper surface of the cephalothorax in both species being almost similar, but the cephalothorax of *M. dentipes* is not so enlarged as in *M. distinctus*, the breadth to the length in the former being as 19 : 14, and in the latter as 19 : 13. The lateral margins present three incisions, so that four teeth are formed; the first incision is much deeper than the others. The first tooth or external angle of the orbits is a little shorter than the second, whereas in *M. distinctus* the second is a little shorter than the first. In both species the front is scarcely shorter than the epistome; the median part of the latter, however, is still visible when the carapace is viewed from above. In the form and the size of the front, and in the structure of the upper surface of the cephalothorax, both species are identical.

The infraorbital ridge is characteristic of this species, but it differs in the male and in the female. In the male it is continued backwards nearly to, or a little beyond, a point opposite the second lateral incision, and is composed of 25 lobules, of which only six constitute the orbital portion, the remainder being postorbital. In younger specimens, the lobules which constitute the orbital portion are more numerous. These structures are comparatively much larger in this species than in *M. distinctus*, and decrease less gradually but more rapidly in size and length. Each lobule presents at its posterior end a much smaller accessory



Mintern imp.

1-4 METAPLAX [illegible]. 5-6 M. ELEGANS. 7-8 M. INTERMEDIUS.

one, which is united with the chief portion at its base, so that each lobule is transversely sulcate near its posterior end. A similar structure is also found in *M. distinctus*, but in this species the lobules of the orbital portion, 12 or 13 in number, are much smaller, and decrease more gradually in size. The lobules of the postorbital portion decrease more regularly in size, and are rather granuliform. In the female the infraorbital ridge is not prolonged behind the orbits, so that a postorbital portion is wanting; the ridge is composed of 18–20 minute truncate teeth, the first ten or twelve of which are nearly equal, and the posterior ones only decrease slightly in size.

This species, in the pterygostomian regions of its cephalothorax, and in the form and size of the male abdomen and of the outer foot-jaws, agrees with *M. distinctus*. The anterior margin of the buccal cavity also presents the same structure and form in both species.

The chelipedes of the male differ from those of *M. distinctus*. In the adult specimen the left chelipede is much larger than the right, but in the younger specimens (the cephalothorax of which is less than 20 millim. broad) they are equal to one another. The arms do not project so far beyond the lateral margins of the cephalothorax as in *M. distinctus*; when comparing specimens of both species with one another (the cephalothorax of which is 17 millim. broad), the arms scarcely project beyond the lateral margins of the carapace in *M. dentipes*, whereas in *M. distinctus* they reach a little beyond even the middle of the meropodites of the third and fourth legs. In the adult specimen, however, the arms project nearly as far laterally as do those of the smaller *M. distinctus*. The arms have nearly the same form and structure in both species, the upper surface being slightly enlarged towards the distal extremity; the "musical crest" lies on the middle third of the anterior margin, which is minutely denticulated at its distal half, like the posterior margin. In younger individuals the musical crest is found near the distal extremity, as in *Helice tridens*, de Haan.

The wrist is somewhat granular above, especially on its posterior and anterior margins. The larger hand of the adult male is about twice and a half as long as it is broad at the base of the fingers. Though closely resembling *M. distinctus*, the palm is, however, a little less elongate, its length being in proportion to its breadth (height) at the base of the fingers as

13 : 9⅓, whilst in *M. distinctus* it is 13 : 8. In both species the mobile finger does not present the prominent lobe on its inner margin which characterizes *M. elegans* and *M. intermedius*. The fingers are less gaping at their bases than those of *M. distinctus*, and the prominent lobe along the proximal half of the inner margin of the index is less prominent in this species. The inner surface and the upper and under margins of the palm are minutely granular, as also the upper margin of the mobile finger. The smaller hand resembles the larger, but the index presents no prominent lobe, so that the minutely denticulate inner margins of the fingers fit perfectly close together. In younger male specimens the hands are equal and much smaller, and the fingers perfectly close together, leaving no gap between them.

In young female specimens, the cephalothorax of which is 13 or 14 millim. broad, the chelipedes are equal and very small (see Heller, *l. c.*), and their fingers are as long as, or even slightly longer than, the palm. I am unable to describe the chelipedes of the adult female, the collection containing no adult female specimens.

The ambulatory legs of *M. dentipes* wholly agree with those of *M. distinctus*, not only in their length and the relative length of the joints, but also in the armature of their meropodites, which have already been fully described by Heller.

This species therefore differs from *M. distinctus* by its larger size, by its less enlarged and more quadrate carapace, by the structure of its infraorbital ridges, and by the form of its chelipedes.

The largest male specimen is 25¼ millim. broad, and 18¾ millim. long, and the ambulatory legs of the penultimate pair measure 55 millim.

Metaplax dentipes was discovered by Heller at Ceylon.

89. METAPLAX ELEGANS, n. sp. (Pl. XI. figs. 4–6.)

The collection contains the large number of twenty-nine specimens, fifteen of which were found at Mergui.

As this new species is closely allied to *M. distinctus*, M.-Edw., only its distinctive characters need be recorded.

Metaplax elegans scarcely attains the size of *M. distinctus*, the largest specimen in the collection being a little smaller than the two specimens of the latter species described above. As regards the shape of the cephalothorax, both species closely resemble each other, and have on the lateral margins three or four incisions, which cause them to appear four- or five-toothed. In *M. distinctus* the first two antero-lateral teeth are almost equal to one another, the first tooth (the external orbital angle) being scarcely larger than the second; in *M. elegans*, however, the second tooth is distinctly larger than the first. In both species the front is less prominent than the anterior margin of the buccal cavity; but the median lobe of the anterior margin of the buccal cavity is more prominent in *M. elegans*.

The infraorbital ridge is very finely crenulate in the male, even more delicately than in *M. distinctus*, and, as in that species, the ridge is continued backwards nearly opposite to the second antero-lateral incision. In *M. distinctus* the ridge is composed of 25–30 small lobules, of which the first eight or ten, constituting the orbital portion, are longer than broad, and transversely sulcate above. In *M. elegans*, on the contrary, the ridge consists in the male of 50–60 minute rounded teeth or granules, which gradually and regularly decrease in size backwards; in the female, the ridge, as usual, is not prolonged backwards behind the orbits, and consists of 35 teeth, which are similar to those of the male.

As regards the pterygostomian regions and the shape and structure of the outer foot-jaws, both species completely agree with one another, but the abdomen of the male is a little different. In *M. elegans* the first (or terminal) joint is triangular, rounded, and shorter than broad at the base; the second joint is longer than the first, and broader than long, the proportion of the breadth of its posterior margin to its length being as $3\frac{7}{8}$: 2. The third joint is much shorter than the second.

The chelipedes of the male of *M. elegans* are nearly the same size as those of *M. distinctus*, and their arms project as far beyond the lateral margins of the carapace. The anterior legs are, however, more or less unequal, the right or the left being the larger; the arms are somewhat thickened in the middle, and again narrowed at the distal extremity, that part of the anterior margin of the upper surface which bears the musical crest projecting a little more forward than in *M. distinctus*. The hands of the adult male much resemble those of the latter species, the palm being longer than broad (high); but they are a little less slender, the proportion of the length of the palm (of the larger hand) to its breadth (height) at the distal end being as 9 : 6½ (in *M. distinctus* as 9 : 5⅓). The outer and the inner surfaces of the hands are rather convex; the outer surface is quite smooth, but the inner is a little granular. The fingers also much resemble those of *M. distinctus*, but the strongly curved mobile finger is armed with a denticulate, prominent, triangular lobe nearly on the middle of its inner margin (as in some *Macrophthalmi*), which is not found in the other species. In younger individuals this lobe is less developed, and in still younger specimens it is quite absent. The mobile finger is granular along its upper margin.

As regards the form of the ambulatory legs, and more especially their relative length and the comparative length of their joints, both species completely resemble one another; but the meropodites of the legs of the last three pairs are armed in *M. elegans* with more spines along their upper margins, those of the last pair being also armed with eight or nine spines *.

Dimensions of the largest male specimen:—

	millim
Length of the cephalothorax	9¼
Breadth of the cephalothorax (distance between the second antero-lateral teeth)....................	15

90. METAPLAX INTERMEDIUS, n. sp. (Pl. XI. figs. 7–9.)

Two male individuals of this new form were collected at Mergui, along with specimens of the preceding species.

In the shape and structure of its cephalothorax, this *Metaplax* perfectly resembles *M. elegans*, except as regards the infraorbital ridge and the abdomen of the male. In *M. intermedius* the lateral margins are four- or five-toothed, just as in *M. elegans*, the second tooth being somewhat larger than the first. The infraorbital ridge is prolonged backwards, almost opposite to the second lateral incision, and consists of 40–50 small teeth or granules, similar to those of *M. elegans*; but the first or innermost four or five are lobuliform, being longer than broad, resembling the infraorbital lobules of *M. distinctus*. These lobuliform teeth gradually pass into the others, which have the form of granules.

The male abdomen is also characteristic, being more enlarged than that of *M. elegans*; the first joint is triangular and rounded,

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* I may remark that in the species of *Metaplax* in which the meropodites of the ambulatory legs are spinulose, the spines are often worn off by the animal, and therefore sometimes appear to be absent.

and much shorter than it is broad at the base; the second joint also nearly resembles that of *M. elegans*, being trapezoidal and a little longer than the first; the following joints, however, are all more enlarged than in the preceding species, so that, *e. g.*, the third joint is more than twice as broad at its posterior margin as it is long. The lateral margins of the abdomen and the anterior margins of the segments (except those of the first and the second) are fringed with longer hairs than in the two preceding forms.

The chelipedes of the male are somewhat similar to those of *M. elegans*, but the hands are shorter, and the palm is as long as broad (high); in all other species of the genus *Metaplax* which are described is this report, the hands are more or less elongate, the palm being always longer than broad. The chelipedes are a little unequal, the right or the left being the larger one. In the larger specimen, the cephalothorax of which is 12 millim. broad, the arm of the larger chelipede reaches laterally nearly to the middle of the meropodites of the third and fourth legs. The arms are similar to those of *M. elegans*. The musical crest lies on the middle of the anterior margin of the upper surface. The inner margin of the wrist is granular. The hands much resemble one another. The larger hand is scarcely twice as long as it is broad (or high) at the base of the fingers; the palm is as long as broad at the base of the fingers, being here 5¾ millim. broad, and having the same length; the fingers are scarcely shorter than the palm. The hands are rather compressed; the upper and the under margins of the palm are granular, like its inner surface, except near the articulation of the immobile finger, where it is smooth. The outer surface appears smooth to the naked eye, except near the under margin and near the articulation with the wrist, where it is minutely granular. The fingers resemble those of *M. elegans*; the prominent lobe, however, with which the inner margin of the mobile finger is armed, is not found in the middle of it, but nearer to the articulation, and the lobe presents a more quadrangular form, whereas the immobile finger appears comparatively higher at its proximal half.

The ambulatory legs generally resemble those of *M. elegans*. The meropodites, however, are only armed with one single spine near the distal end of their upper margin; the carpopodites and propodites are less slender, and the dactylopodites are comparatively longer than those of *M. elegans*, being scarcely shorter than the propodites. For example, the dactylopodites of the legs of the penultimate pair are in proportion to the propodites as 4¼ : 3¾, but in *M. elegans* as 4¼ : 3.

Dimensions of the larger specimen :—

	millim.
Breadth of the cephalothorax (distance between the second antero-lateral teeth)	11¾
Length of the cephalothorax	7¾
Length of the larger hand (fingers included)	11¼

Genus SESARMA, *Say*.

SECTION A.—*Sesarmæ* without an epibranchial tooth behind the external orbital angle, and in which the upper surface of the palm of the hands of the male presents no oblique, parallel, pectinated ridges.

91. SESARMA AUBRYI, *A. M.-Edw.*

Sesarma Aubryi, *Alph. Milne-Edwards, Nouv. Arch. du Muséum Hist. Nat.* 1869, t. v. *Bulletin*, p. 29, and 1873, t. ix. p. 307, pl. xvi. fig. 3.

Sesarma (Holometopus) Aubryi, *Miers, Proc. Zool. Soc.* 1877, p. 137; *de Man, Notes from the Leyden Museum*, vol. ii. p. 30.

Thirteen specimens (9 ♂, 4 ♀) were collected in the Mergui district, twelve of which were captured in fresh water at Sullivan Island.

Sesarma Aubryi has hitherto been found in the seas of New Caledonia, Duke-of-York Island, and at Amboina; it would thus appear to inhabit the seas of the whole Indo-Malayan Archipelago.

SECTION B.—*Sesarmæ* without an epibranchial tooth behind the external orbital angles, and in which the upper margin of the palm of the anterior legs of the male bears two or more oblique, parallel, minutely pectinated ridges.

So far as I am aware, six Oriental species have been described, presenting the characters of this section :—

Sesarma quadrata, Fabr., from the East Indies.
—— *affinis*, de Haan, from Japan.
—— *picta*, de Haan, also from Japan.
—— *ungulata*, M.-Edw., from Celebes and the Philippines.
—— *erythrodactyla*, Hess, from Sydney.
—— *aspera*, Heller, from Ceylon, Madras, and the Nicobars.

After a careful examination of the typical specimens of these species, I am inclined to regard *S. ungulata*, M.-Edw., as identical with *S. affinis*, de Haan, and both identical with *S. quadrata*, Fabr. *S. picta*, de Haan, is a different form, and also *S. erythrodactyla*, Hess. *S. aspera* is closely allied to *S. quadrata*, Fabr., and is probably a mere local variety of it.

I am able now to describe two new forms of this section, one of which is closely allied to Heller's *S. aspera*, whereas the other is a most interesting form, leading from the typical *Grapsidæ* to the *Sesarmæ*.

92. SESARMA ASPERA, *Heller*.

(Compared with the typical specimens of the 'Novara' Expedition.)

Sesarma aspera, *Heller*, *Crustaceen der Novara-Reise*, p. 63, Taf. vi. fig. 1.

Three young female specimens were collected in Elphinstone Island. Dr. C. Kœlbel, of Vienna, kindly enabled me to study two typical specimens of Heller's *S. aspera*, an adult male from the Nicobar Islands and a somewhat smaller female from Madras.

Dr. F. Meinert, of Copenhagen, kindly gave me an excellent photograph of *Cancer quadratus*, Fabricius (Suppl. Entom. Syst. p. 341), together with the exact dimensions of the typical specimen, which is preserved in the Zoological Museum of the University of Copenhagen. I have, moreover, studied the typical specimens of *S. ungulata*, M.-Edw., and of *S. erythrodactyla*, Hess.

A careful examination has convinced me that *S. ungulata*, M.-Edw., and *S. quadrata*, Fabr., are identical with *S. affinis*, de Haan. *S. quadrata* of Milne-Edwards is quite another species. Prof. A. Milne-Edwards sent me a young female specimen of his *S. quadrata*; and although I am unable to describe the characters of the adult male, it is evident at first sight that the specimen in question differs from the true *S. quadrata*, Fabr., by its cephalothorax being almost exactly quadrate, whereas in *S. quadrata*, Fabr., the cephalothorax is distinctly broader than long.

Sesarma aspera, Heller, is most closely allied to *Sesarma quadrata*, Fabr. Its distinctive characters are merely the following:—

The cephalothorax is not so large as that of *S. quadrata*, Fabr.; in Heller's type specimens the proportion of the distance between the external orbital angles to the length of the cephalothorax is as 20 : 16½, in *S. quadrata*, Fabr.,=*ungulata*, M.-Edw., =*affinis*, de Haan, as 20 : 15½. In the proportion of the distance between the external orbital angles to the breadth of the front, *S. aspera* completely agrees with *S. quadrata*, Fabr. The penultimate joint of the male abdomen has a somewhat different form, being smaller than in *S. quadrata*, Fabr. The legs of both species almost completely agree with one another, the only differences observable being the following:—The oval transverse tubercles, which occur on the upper margin of the mobile finger of the male, number 16 or 17 in *S. aspera*, whereas in the typical specimen of *S. quadrata* there are only 11–13, of which the proximal 7–9 tubercles are more distinct than the others.

The species of this section seem to be comparatively rare, for few specimens exist in museums; but when a more extended series is available for comparison, I am disposed to believe that the differences I have indicated will be found to be individual. The Leyden Museum contains only a single male specimen from an unknown locality; this specimen has 12–13 tubercles on the mobile finger, and certainly belongs to the true *S. quadrata*, Fabr.; it was, however, referred by me to *S. affinis*, de Haan, when I worked out the Leyden collection. *Sesarma aspera* with 17 tubercles on the mobile finger, *S. quadrata* with 11–13, *S. ungulata* with 8, and *S. affinis* with 7, are, I think, mere local or perhaps only individual varieties of one and the same species (*S. quadrata*, Fabr.).

Sesarma aspera, Heller, has been recorded from Ceylon, Madras, and the Nicobar Islands.

93. SESARMA MELISSA *, n. sp. (Pl. XII. figs. 5–7.)

One male specimen was collected in Kisseraing Island. This species agrees almost completely in all its characters with Heller's *Sesarma aspera*, and differs from it only by the different form of the prominences with which the upper margin of the mobile finger is armed, by its somewhat more slender ambulatory legs, and by the dactylopodites being comparatively a little shorter.

In the structure and dimensions of the cephalothorax, and in the form of the front and of the male abdomen, both species are alike.

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* *Melissa*, the daughter of *Oceanus*.

The anterior legs are also nearly alike in both species, but the prominences of the upper margin of the mobile finger have a characteristic form distinctive in each. In the male of *S. aspera*, the upper margin of the mobile finger presents a row of 16 or 17 transverse oval tubercles, each of which is symmetrical with regard to a median, transverse, smooth ridge, the tubercles resembling a *Chiton*, as in *S. bidens*, de Haan. In *S. Melissa* the upper margin of the mobile finger presents a row of 14–15 prominences, which are also transverse, but are not symmetrical and do not resemble a *Chiton*. The anterior (distal) declivity of each tubercle is larger than the posterior (proximal) declivity, and the former is distinctly excavated, the prominences being somewhat horseshoe-shaped. In other particulars, the hands are perfectly similar in the two species; and in each the anterior margin of the arm presents an acute spine, and its upper margin terminates also in a small acute tooth.

The meropodites have the same form, being equally enlarged in both species. The carpopodites and propodites are, however, a little more slender in *S. Melissa* than in *S aspera*, and the dactylopodites are a little shorter in proportion to the length of the propodites.

The upper surface of the cephalothorax is ornamented with violet markings, and the propodites of the ambulatory legs with two violet rings, parallel to one another.

Dimensions:—

	millim.
Distance between the external orbital angles	15
Length of the cephalothorax	12¼
Breadth of the front	8⅔

Sesarma Melissa stands in the same relation to *Sesarma aspera* as *Sesarma Haswelli* to *Sesarma bidens*.

94. Sesarma picta, *de Haan*.

Grapsus (Pachysoma) pictus, *de Haan, Fauna Japon. Crust.* p. 61, Taf. xvi. fig. 6.

Sesarma picta, *Milne-Edwards, Ann. Sci. Nat.* 3e série, t. xx. p. 184; *de Man, Notes from the Leyden Museum*, vol. ii. p. 22.

The collection contains one young female specimen, found in fresh water on Sullivan Island.

The distance between the external orbital angles measures 12⅔ millim., the front between the eyes 6⅓ millim., and the cephalothorax is 10 millim. long.

Sesarma picta may be easily distinguished from *Sesarma quadrata*, Fabr. (=*affinis*, de Haan=*ungulata*, M.-Edw.), from *S. aspera*, Heller, and from *S. erythrodactyla*, Hess, by its narrow front, which is exactly half as broad as the distance between the external orbital angles. The ambulatory legs of *S. picta*, de Haan, are moreover of a more slender form than those of *S. quadrata*.

Sesarma picta has been found in Japan, and the Leyden Museum possesses a specimen from Macassar, Celebes; it is therefore probable that this species will be found to occur in the Malayan Archipelago.

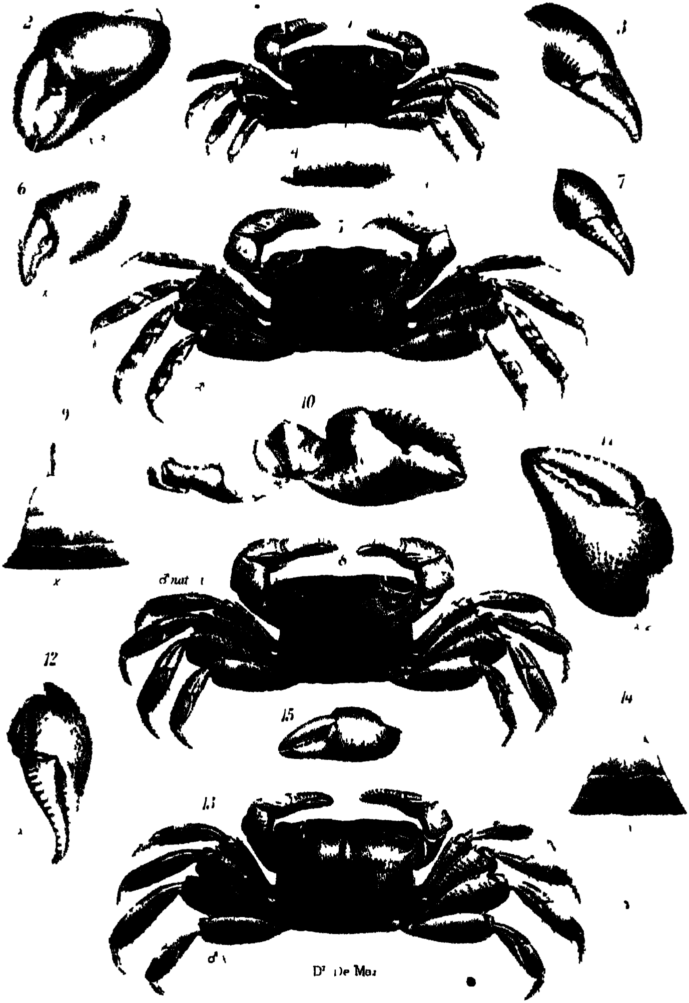
95. SESARMA ANDERSONI, n. sp. (Pl. XII figs. 1–4.)

Nineteen specimens (8 ♂, 11 ♀) of this most interesting species were "found at low water, in the deep but narrow burrows of dead *Novaculina* sp., on the banks of the Tenasserim river, at Minthantoung."

The numerous species of the genus *Sesarma* nearly all agree with one another, so far as I am aware, in one character, namely, that the posterior margins of the meropodites of the ambulatory legs are entire, and never armed with the acute teeth which are characteristic of the more typical Grapsidæ. In only a single species, viz. the Japanese *Sesarma vestita*, Stimpson, are the meropodites of the ambulatory legs described as being denticulate at the external angle of their posterior margin.

Sesarma Andersoni appears to be allied to *S. vestita*, but may be distinguished from it at first sight by its much more enlarged carapace, which has a glabrous and shining upper surface, and by many other characters *S. vestita* and this new species are among the smallest representatives of this interesting genus, the cephalothorax being little more than one centimetre broad.

The cephalothorax is enlarged, being much broader than long; the proportion of the distance between the external orbital angles to the length of the carapace is as 13 : 9½. The rather depressed upper surface is marked with the ordinary interregional grooves and is quite glabrous, smooth, and bright, though minutely punctate, when seen under a magnifying-glass. The front is rather broad; measured between the eye-peduncles, its breadth slightly exceeds half the distance between the external orbital angles, the proportion being as 7⅔ : 13. The front is vertically deflexed, its anterior margin is nearly straight, not at all



Dr. De Man

Crowther lith. Mintern imp.

4 [illegible] ANDER[illegible]

5-7. S. MELISSA. 8 [illegible] SCHMIL[illegible] 13-15 [illegible] sp.

emarginate in the middle, and is perfectly smooth. The four subequal postfrontal lobes are little prominent, so that they do not conceal the anterior margin of the front, when the carapace is looked at from above. The upper orbital margin is very oblique. The straight lateral margins of the upper surface of the carapace are nearly parallel, scarcely converging backwards; behind their lateral tooth (the acute external orbital angle) they present a trace of a second tooth. The foremost of the oblique elevated lines with which the sides of the upper surface are provided projects a little externally beyond the lateral margin, and sometimes even the next oblique line projects a little beyond the lateral margin, though not so much as the foremost, and in these specimens a trace even of a third tooth is observed.

As regards the under surface of the cephalothorax, I have little to remark. The male abdomen has about the same form as in *S. quadrata*, Fabr. (=*ungulata*, M.-Edw.,=*affinis*, de Haan), the penultimate joint appearing rather short in proportion to its breadth. The last joint of the female abdomen is pushed deeply into the penultimate.

In the adult male the anterior legs are of unequal size. The ischiopodite of the anterior legs is armed anteriorly with a small acute tubercle. The acute upper margin of the arm is entire; its distal end is rounded and does not terminate in an acute spine. The anterior margin is dilated distally into a triangular crest, which appears minutely denticulate anteriorly, but is never armed with a spine. The acute under margin is also almost entire. The outer surface of the arm is transversely rugose, but the anterior and the inner surfaces are almost perfectly smooth, the triangular crest of the anterior margin presenting only some rugose lines on its inner surface, and is separated from the rest of the inner surface of the arm by the ordinary marginal row of hairs.

The upper surface of the carpopodite is covered with many minutely granular, transverse lines, and the inner angle is not armed with a tooth; the inner margin presents a few short hairs near the articulation with the arm. The convex outer surface of the palm is almost smooth, being, however, minutely rugose towards the upper margin and close to the articulation with the wrist, and minutely punctate near the articulation with the mobile finger. The rounded under margin presents some delicate rugose lines, and an elevated line is seen on the outer surface of the palm, not far from the under margin and parallel to it, proceeding from the articulation with the wrist to the acute tooth which is found on the inner margin of the index. On the upper surface of the palm, near the inner margin, many oblique, minutely pectinated ridges run parallel to one another, namely, two longer ridges near the inner margin, and seven or eight shorter ones more outwards. The inner surface of the palm is a little granular. In the larger hand of the adult male the fingers are sometimes widely gaping, the mobile finger being much arcuate; but in other and younger specimens there is no gap between them. The upper surface of the mobile finger is covered with a row of thirteen or fourteen transverse ridges, and is moreover somewhat granular at its base, especially on the inner side. The outer and inner surfaces of the fingers are smooth; the fingers have horny, somewhat excavated tips. The inner margin of the thumb is armed at its base with two strong teeth, the internal one exceeding the other in size when the fingers are gaping; immediately before the horny tip both fingers are armed with a somewhat larger tooth. The index is armed, moreover, with seven or eight teeth, one of which, situated nearly in the middle, is much larger and stronger than the others.

In the adult female the chelipedes and also the hands are much smaller than in the male; they have, however, the same form and structure, but the pectinated ridges on the upper margin of the palm are rudimentary or absent and the upper margin of the thumb presents no transverse ridges, being only somewhat granular at the base.

In their outer appearance the ambulatory legs resemble those of *S. aspera*, but differ from that species, and almost from all other representatives of the genus *Sesarma*, by the structure of the meropodites. The upper or anterior margins of the meropodites do not terminate at their distal ends in a spine, but the posterior margins are denticulate, much as in some typical *Grapsidæ*. Four or five teeth are found at the distal angle, the proximal tooth being the largest, and the others diminish gradually in size towards the articulation with the carpopodite. The outer surface of the meropodites is somewhat transversely rugose and granular. The other joints are unarmed, but a little hairy. The dactylopodites are comparatively much shorter than in *S. aspera*, Heller, being much shorter than the propodites; they are a little spinulose.

Dimensions of the two largest specimens in the collection, the female being provided with eggs:—

	♂. millim.	♀. millim.
Distance between the extraorbital teeth..	12⅔	10⅓
Length of the cephalothorax	9¼	7⅜
Breadth of the front between the eyes ..	7⅕	5⅘

In the smallest ova-bearing female, the distance between the extraorbital teeth measures only 8 millim.

Section C.—*Sesarmæ* in which the cephalothorax is armed with an epibranchial tooth behind the extraorbital tooth, and in which the upper margin of the palm of the anterior legs of the male presents two or three oblique, parallel, minutely pectinated ridges.

This small section contains only the following Oriental species:—

Sesarma bidens, de Haan.
—— *Dussumieri*, M.-Edw.
—— *guttata*, A. M.-Edw.
—— *livida*, A. M.-Edw.

I am now enabled to add a fifth species, viz. *Sesarma Haswelli*, n. sp. It is extremely difficult to distinguish these species, but a careful examination of the typical specimens, preserved in the Museums of Leyden and Paris, enables me to enumerate their distinctive characters.

Each species seems to be proper to different parts of the Indo-Pacific Region. *Sesarma bidens* inhabits the Japanese and Chinese seas and the Malayan Archipelago (Amboina); *S. Haswelli* and *S. Dussumieri* seem to be proper to the northern and north-eastern part of the Indian Ocean; *S. livida* has been recorded from New Caledonia, and seems to inhabit also the Gulf of Bengal; and, finally, *S. guttata* occurs on the south-eastern coast of Africa.

These closely allied species may be distinguished by the form of the hands, the number of tubercles with which the mobile finger is provided, the form and the structure of these prominences, and by the shape of the joints of the male abdomen.

96. Sesarma Haswelli, n. sp.

(Compared with a typical specimen of *Sesarma bidens*, de H.)

Two young male specimens were collected at Sullivan Island.

I was inclined at first to regard this species as a mere local variety of de Haan's *Sesarma bidens*, but after a more careful examination I consider it to be a distinct species. *Sesarma Haswelli*, however, is most closely allied to *Sesarma bidens*, de Haan. As regards the form and structure of the cephalothorax, both species closely resemble one another, not only with respect to the upper surface and the form of the front, but also with respect to the form of the joints of the male abdomen. The ambulatory legs also completely resemble those of *Sesarma bidens*, as regards the comparative length and breadth of the joints; and their coloration is the same in both species. *S. Haswelli* only differs from *S. bidens* by the number and by the form of the tubercles of the upper margin of the mobile finger.

The mobile finger is a little less arcuate at its base than that of *Sesarma bidens*, being more straight, and it is covered in the right hand, which in our larger specimen is a little larger than the left, with a longitudinal row of 18–19 tubercles, whereas in the left there are only 16 tubercles. In *Sesarma bidens* only 13 tubercles are constantly found on the upper margin of the mobile finger. These tubercles have a different appearance in the two species, extremely difficult to describe.

In *Sesarma guttata* from the shores of Zanzibar, the mobile finger is covered above with 12–13 tubercles; in this species these tubercles are ovoid, rather prominent, and their longer axis is transverse, making a right angle with the longitudinal axis of the finger. These symmetrical tubercles completely resemble some species of *Chiton*, for they present a smooth ridge in the middle, which runs in the longer axis of the tubercle and which is transversely sulcate.

In *Sesarma bidens* the tubercles are similar to those of *S. guttata*, but they are lower and much less prominent. In *Sesarma Haswelli*, however, the tubercles are less distinctly *Chiton*-like; they are more depressed above and are scalariform, each tubercle being nearly vertically deflexed at its distal margin towards the vent; they are transverse, as in all species of this section of the genus, the longer axis being perpendicular to the axis of the finger.

In all other characters the hands are similar to those of *S. bidens*. The outer surface of the immobile finger is somewhat flattened, or slightly concave, presenting a slight longitudinal, ridge-like elevation below, parallel to the under

Treasurer's Account for the year from May 1, 1886, to April 30, 1887. (Presented at the Anniversary Meeting, Tuesday, May 24, 1887.)

Receipts and Payments.

Receipts.				£	s.	d.
Balance at Bankers' on 1st May, 1886				381	12	9
Interest on Investments				190	14	0
Admission Fees				288	0	0
Annual Contributions				1260	3	0
Compositions				180	0	0
Sales of Publications:—						
Transactions	£145	16	7			
Journals	116	10	10			
Proceedings and Catalogues	3	1	6			
				265	8	11
Donation				113	10	2
				£2679	8	10

Payments.				£	s.	d.
Taxes and Insurance				22	13	9
Repairs and Furniture				38	0	10
Coals and Gas				69	5	0
Salaries and Commission				431	13	4
Library:—						
Books	£140	6	5			
Binding	82	8	2			
				222	14	7
Expenses of Publications:—						
Printing	£583	15	6			
Illustrations	631	5	5			
Distribution	68	7	4			
				1283	8	3
Miscellaneous Printing and Stationery				65	14	0
Petty expenses (including Tea and Postage)				74	10	4
Investment				150	0	0
Balance at Bankers' on 30th April, 1887				321	8	9
				£2679	8	10

Investments on 30th April, 1887.

	£	s.	d.
Consols	3511	19	0
Metropolitan Board of Works 3½ per cent. Stock	1184	15	11
Great Indian Peninsula Railway 5 per cent. Guaranteed Stock	938	14	0
Do. Do. Do. 4 per cent. Debenture Stock	108	0	0
Forth Bridge Railway Co. 4 per cent. Stock	495	0	0
	£6238	8	11

FRANK CRISP, *Treasurer.*

The foregoing accounts have been examined and found correct.

FRED. V. DICKINS,
WILLIAM CARRUTHERS,
ALBERT D. MICHAEL,
B. DAYDON JACKSON,
Auditors.

May 12, 1887.

LINNEAN SOCIETY OF LONDON.

LIST OF THE OFFICERS AND COUNCIL.

Elected 24th May, 1887.

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William Carruthers, F.R.S.

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Frank Crisp, LL.B., B.A.
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This consists of nine Fellows (three of whom retire annually) and of the four officers *ex officio*, in all thirteen members. The former are elected annually by the Council in June, and serve till the succeeding Anniversary. The Members for 1887–88, in addition to the officers, are:—

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William Sweetland Dallas, Esq.
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Frederick Du Cane Godman, F.R.S.
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margin; this character is presented also by *S. bidens* and *S. guttata*, but never by *S. Dussumieri*. In both species the inner surface of the hands is only faintly granular. The joints of the male abdomen are quite similar in *S. Haswelli* and *S. bidens*; the figure of the latter in the 'Fauna Japonica' may therefore be consulted.

Dimensions of the larger specimen:—

	millim.
Distance between the extraorbital teeth	17⅕
Length of the cephalothorax	13¾

Sesarma Haswelli occurs also at Ceylon, and I have little doubt that the specimen recorded by Hilgendorf from that locality belongs to *S. Haswelli* (Crustaceen von Ost-Africa, p. 91, in V. d. Decken's Reisen).

I now add for comparison the distinctive characters of *S. guttata*, which inhabits the eastern coast of Africa. This species is also most closely allied to *S. bidens*, but the tubercles of the upper margin of the mobile finger are larger and more prominent, and the penultimate joint of the male abdomen is comparatively much longer, the proportion of the breadth of its posterior margin to the length being in *S. guttata* as 7 : 5, and in *S. bidens* as 7 : 3½. The prominent tooth near the distal end of the anterior margin of the arm, which in *S. bidens* is very acute, simple, and spiniform, is represented in *S. guttata* by an acute dentiform prominence, which is itself a little denticulate. The second antero-lateral teeth of the cephalothorax are somewhat more prominent in *S. guttata*. In other respects these two forms closely resemble one another.

97. Sesarma Dussumieri, *M.-Edw.* (Pl. XII. figs. 8–12.)

Sesarma Dussumieri, *Milne-Edwards, Annales des Sciences Naturelles*, t. xx. 1853, p. 185.

One fine male specimen was collected at Tavoy.

Sesarma Dussumieri was unsatisfactorily characterized by the late H. Milne-Edwards, and it has therefore never been recognized by subsequent authors. It differs more from *S. bidens* than from *Sesarma Haswelli* and *S. guttata*. Except in the abdomen of the male, the joints of which have a different form, the cephalothorax of *Sesarma Dussumieri* resembles that of *Sesarma bidens*. The third joint of the male abdomen, which is the broadest of all, is comparatively shorter in *S. Dussu-*

mieri than in *S. bidens*; the fourth joint is also comparatively shorter and appears therefore more enlarged in this species than in de Haan's; the fifth joint has nearly the same form in both species. The penultimate joint, however, in *S. Dussumieri* is comparatively much longer than in *S. bidens*, the proportion of the breadth of the posterior margin to the length of the joint being as 7 : 4½, and in *S. bidens* as 7 : 3½; this joint, moreover, is more narrowed towards the terminal segment, the breadth of the posterior margin being in proportion to the breadth of the anterior margin as 7 : 3, but in *S. bidens* as 7 : 4. The lateral margins of this joint are also a little more rounded than those of *S. bidens*. The terminal joint is comparatively longer in *S. Dussumieri* than in *S. bidens*.

The anterior legs or chelipedes of *S. Dussumieri* are very distinctive of the species, and are, as in *S. bidens*, equal to one another. The upper margin of the arm of *S. bidens* terminates at the distal end in a short acute tooth, which is not found in *S. Dussumieri*. In the species of the 'Fauna Japonica' the anterior margin of the merus-joint is armed with a simple, strong, acute spine, but in *S. Dussumieri* this spine is represented by a prominent triangular tooth, the margins of which are denticulate.

In the general appearance of the hands and the proportion between the length of the fingers and of the palm, this species is very similar to *S. bidens*. The hands, however, present the following distinctive characters:—the outer surface of the palm and of the fingers in *S. Dussumieri* is more convex than in *S. bidens*, and the outer surface of the immobile finger is convex and quite smooth; whereas in *S. bidens*, *S. Haswelli*, and *S. guttata* it is flattened or even very slightly concave, somewhat granular and bordered below by a slight ridge-like elevation, parallel to the under margin. The outer surface of the palm is granular, as in *S. bidens*, but the granules gradually disappear towards the base of the immobile finger. In *S. Dussumieri* the inner surface of the palm is much more granular than in all the other species of this section, presenting many prominent, acute, subspiniform granules of different sizes, the largest of which are found about the middle of the inner surface. The two pectinated ridges are a little longer and somewhat more oblique in this species than in *S. bidens*, and when the hands are in the ordinary position of rest, lying close to the cephalothorax, these ridges lie in a transverse direction, parallel to the frontal margin; in *S. bidens*, *S. Haswelli*, and *S. guttata*, on the contrary, they appear to be directed obliquely, forming an angle with the frontal margin, when the hands are in the same position. The distal row is composed of 18–22 teeth, the other of a somewhat smaller number. The mobile finger is less granular externally than in *S. bidens*, presenting some granules only at the base; it is covered on its upper margin with a row of 12 or 13 transverse prominences, which differ much in form from those of *Sesarma bidens* and *S. guttata*. They are scalariform, and closely resemble those of *S. Haswelli*, each prominence being flattened above and more or less declivous at its distal margin; in *S. Dussumieri*, however, they are comparatively larger than in *S Haswelli*, as well as fewer in number. The granules on the proximal half of the finger, at the inner side of the row of prominences, are more acute in *S. Haswelli* than in the other species, and nearly subspiniform. The inner surface of the mobile finger is smooth, that of the immobile finger rather granular.

The ambulatory legs resemble closely those of *Sesarma bidens*, but the dactylopodites are a little longer in proportion to the propodites, the proportion of the propodites to the dactylopodites of the penultimate pair being in *S. Dussumieri* as 8 : 7, in *S. bidens* as 8 . 6.

Dimensions:—

	millim.
Distance between the extraorbital teeth	21⅓
Length of the cephalothorax	18⅓

In a typical specimen from the Paris Museum these numbers are respectively 30 and 25½.

Sesarma Dussumieri has hitherto been recorded from Bombay; it thus inhabits the northern part of the Indian Ocean.

98. SESARMA LIVIDA, *A. M.-Edw.*

Sesarma lividum, *Alph. Milne-Edwards, Nouv. Archives du Muséum Hist. Nat.* t. v. *Bulletin*, p. 25 (1869), and t. ix. p. 303, pl. xvi. fig. 2 (1873).

Seven young male specimens were collected—three from the mangrove-swamps at Zediwon, one from Kisseraing, and three specimens elsewhere. These I refer with some doubt to this species.

Sesarma livida is the fifth species of this section of the genus, and has hitherto been known only from the seas of New Caledonia. It is closely allied to the four other representatives of this section mentioned above. Its cephalothorax resembles so closely that of the other species, that it is scarcely possible to distinguish between them. The principal characters by which it differs from the other species are found in the anterior legs and more especially in the hands.

In *S. livida* the fingers are comparatively shorter in proportion to the palm, the latter being more developed. The proportion of the horizontal length of the fingers to that of the palm, measured at the lower margin, is in *S. livida* as 10 : 11, in *S. guttata* as 10 : 9½, in *S. Haswelli* as 10 : 9, in *S. bidens* and in *S. Dussumieri* as 10 : 8. In *Sesarma livida* the immobile finger is thus shorter than the length of the lower margin of the palm; in the four other species the latter is shorter than the immobile finger.

The anterior margin of the arm presents a strong, simple, acute, and triangular tooth; and the upper margin of the immobile finger is covered with a longitudinal row of 10–11 low and somewhat scalariform prominences. As regards the form of the male abdomen, *S. livida* completely agrees with *S. bidens*.

The Mergui specimens agree very well, in the form of the cephalothorax and the shape of the male abdomen, with the adult typical specimen of *S. livida* in the Paris Museum. The legs, however, are slightly different. Thus the spine of the anterior margin of the arm has a somewhat different form from the New-Caledonian type, in which the anterior (distal) margin of the spine makes a rather obtuse angle with the distal part of the anterior margin of the arm, lying beyond the spine, whereas in the Mergui examples the angle so formed is nearly a right angle, as in *S. bidens*. The fingers are shorter than the palm, the above-defined proportion being as 10 12. The upper margin of the mobile finger presents only seven slightly prominent elevations, which seem to have a different structure from those of the New-Caledonian type specimen. The outer surface of the immobile finger is also a little more flattened than in the latter, and the meropodites of the ambulatory legs are somewhat more enlarged. Perhaps a careful examination of adult specimens of the Mergui species will prove it to be distinct from the New-Caledonian *Sesarma livida*.

Dimensions of the largest specimen:—

	millim.
Distance between the extraorbital teeth	16¼
Length of the cephalothorax	13

SECTION D.—*Sesarmæ* the cephalothorax of which is armed with one or two epibranchial teeth behind the extraorbital tooth, and in which the palm of the anterior legs of the male is not armed with two oblique, parallel, minutely pectinated ridges.

This Section is represented in the Indo-Pacific Region by a rather large number of species, some of which it is difficult to distinguish.

99. SESARMA TÆNIOLATA, *White*.

Sesarma tæniolata, *White, List Crust. Brit. Mus.* p. 38 (1847); *Miers, Crustaceans from Duke-of-York Island, Proc. Zool. Soc.* 1877, p. 137 (footnote).

Sesarma tæniolata, *de Man, Notes from the Leyden Museum,* vol. ii. p. 26.

Sesarma Mederi, *Milne-Edwards, Ann. Sci. Nat* t. xx. p. 185 (1853).

Three fine male specimens were collected. In all these examples the upper surface of the cephalothorax is densely covered with small tufts of hairs.

Sesarma tæniolata, White, is closely allied to *Sesarma Lafondi*, Hombr. & Jacq., the cephalothorax and the ambulatory legs in both species being similar. The former, however, may be distinguished at first sight by the longitudinal pectinated ridge on the upper margin of the palm of its chelipedes, and by the occurrence of a longitudinal transversely striated ridge on its mobile finger. These two species differ from many other species of this section, in which the distance between the extraorbital teeth is greater than the length of the cephalothorax (as, *e.g.*, from *S. tetragona*, *S. rotundifrons*, *S intermedia*, *S. sinensis*), by the upper margin of the arms of their anterior legs terminating in a strong acute tooth at its distal end, and by the anterior margin being armed with a prominent denticulated tooth. *S. tæniolata* serves to connect this section of the genus with the preceding, as the upper margin of the palm of the anterior legs is furnished with only a single pectinated ridge.

A careful examination of a typical specimen of *S. Mederi* in the Museum of Paris convinced me that this species is identical with *S. tæniolata*, White. Although the latter name has priority, the first description of this species was published by Milne-Edwards.

I have elsewhere pointed out that specimens of this species in the Leyden Museum had been labelled, by the author of the 'Fauna Japonica,' *Grapsus* (*Pachysoma*) *fascicularis* and *S. tetragona*, whereas these forms are perfectly distinct.

Sesarma tæniolata has been collected on the Philippine Islands, and in the seas of Celebes, Java, and Borneo.

100. SESARMA INTERMEDIA, *de Haan*.

Grapsus (Pachysoma) intermedius, *de Haan, Fauna Japonica, Crust.* p. 61, pl. xvi. fig. 5.

Sesarma intermedia, *Milne-Edwards, Ann. Sci. Nat.* 3ᵉ série, t. xx. p. 186; *de Man, Notes from the Leyden Museum*, vol. ii. p. 25.

Thirteen very young specimens were collected (7 ♂, 6 ♀), nine of which were captured in the mangrove-swamps of Zediwon.

Sesarma intermedia, de Haan, and *S. sinensis*, M.-Edw., are two closely allied species inhabiting the same seas. Perhaps they may prove to be identical. I have before me a typical specimen of *S. sinensis*, M.-Edw, from the Paris Museum; but I have not been able to compare the Mergui specimens with the unique type of *S intermedia* in the Leyden Museum, as the rules of the Museum did not admit of its being sent to me. The thirteen specimens undoubtedly belong to a different species from *S. sinensis*, and I am inclined to regard them as representatives of *S. intermedia*.

Sesarma intermedia and *S. sinensis* are to be placed along with those species of this section in which the distance between the extraorbital teeth is greater than the length of the cephalothorax, and in which the upper and anterior margins of the arms of the anterior legs are unarmed; they are therefore allied to *Sesarma tetragona*, M.-Edw., and *S. rotundifrons*, but they may be distinguished by their less enlarged, more quadrate, and more depressed cephalothorax.

The cephalothorax completely resembles that of *S. sinensis*; it is nearly quadrate, the proportion of the distance between the extraorbital teeth to the length being as 9 : 8 in both species; the upper surface is rather depressed, and the lateral margins are parallel to one another. The front, however, is a little narrower in *S. sinensis*, the proportion of the distance between the extraorbital teeth to the breadth of the front being as 11 : 6, and in these specimens as 11 : 7. As regards the form of the joints of the male abdomen, the Mergui specimens perfectly agree with the figure in the 'Fauna Japonica.' Both species, however, may be distinguished by the form of the hands and of the ambulatory legs. The hands of these specimens closely resemble those of *S. tetragona*, M.-Edw. (*nec* Fabr.), the proportion of the length of the fingers to that of the palm, measured at the lower margin, being in both species as 17½ : 13, whereas in *S. sinensis* the numbers are respectively 17½ : 9½. In *S. sinensis* the fingers, therefore, are much longer in proportion to the size of the palm. The inner surface of the palm is armed with a transverse granulated crest, as in *S. sinensis*; the outer surface is also granular in both species, and the outer surface of the fingers is quite smooth. The upper margin of the mobile finger is somewhat granular at the base, but the rest is quite smooth; in *S. sinensis* this finger is also somewhat granular on its upper margin.

The ambulatory legs also present a good character for distinguishing both species. In *S. sinensis* the meropodites are slender, those of the first pair being three times as long as broad, whereas in the Mergui specimens they are enlarged, those of the first pair being scarcely twice as long as broad.

In other respects these two *Sesarmæ* closely resemble each other.

Dimensions of the largest specimen:—

	♂ millim.
Distance between the extraorbital teeth	13¾
Length of the cephalothorax	11¾
Breadth of the front, measured between the eyes..	8¾

Sesarma intermedia has been recorded from Japan, Hongkong, Shanghai, and from the coast of Java.

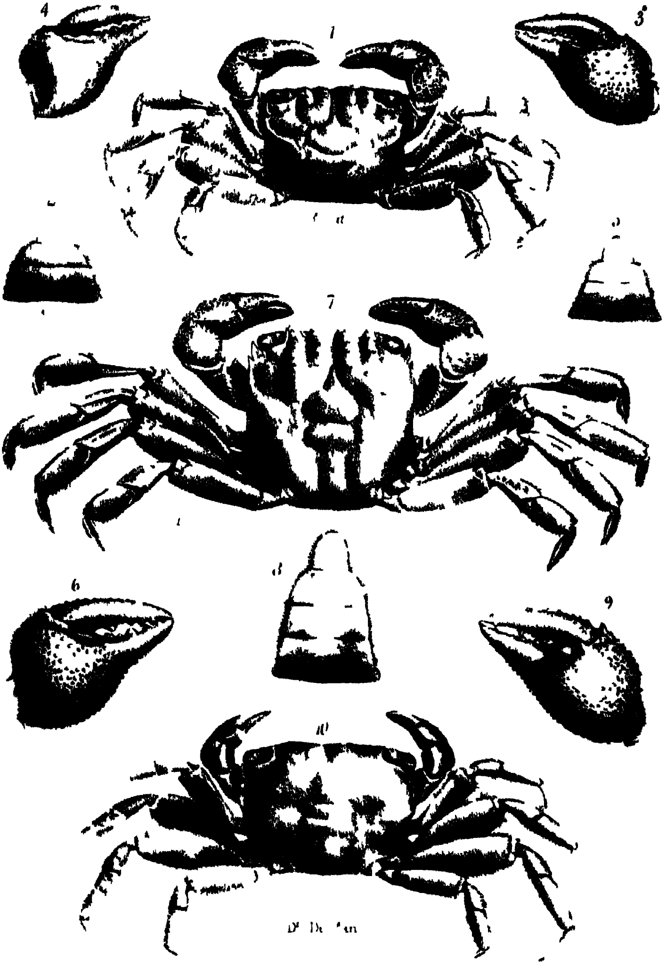
101. Sesarma, n. sp.? (Pl. XII. figs. 13–15.)

There is in the collection a small *Sesarma* from Tavoy, which I suppose to be new, but I hesitate to name it as it is an extremely young individual.

It is closely allied to *S. intermedia* and *S. sinensis*, but is distinguished from them by the occurrence of an acute spine on the anterior margin of the arms of the first pair of legs.

The cephalothorax appears to be scarcely more enlarged than that of *S. intermedia*, the proportion of the distance between the extraorbital teeth to the length being as 9 : 7½; it is, therefore, nearly quadrate. The upper surface is rather depressed as in *S. intermedia* and *S. sinensis*, and is smooth, glabrous, and shining, the interregional grooves being almost obsolete; the epigastric and the protogastric lobes are, however, marked with a few short and small impressions, as in many other species of this genus. The lateral margins are parallel to one another, and present a small, little prominent, epibranchial tooth behind the extraorbital tooth. Laterally, the upper surface presents the ordinary oblique, elevated lines. The front is similar to that of *S. sinensis*, and is vertically deflexed; the proportion of the distance between the extraorbital teeth to the breadth of the front, measured between the eye-peduncles, is as 11 : 6, it is consequently a little broader than half the distance between the extraorbital teeth. The anterior margin is slightly emarginate in the middle, and the four postfrontal lobes are nearly equal to each other, and, being little prominent, they do not hide the anterior margin, when the carapace is looked at from above. The penultimate joint of the male abdomen (fig. 14) has a different form from that of *S. intermedia*, being comparatively much longer in proportion to its breadth.

The legs very closely resemble those of specimens of *S. intermedia* of equal size, but the following distinctive characters occur. The anterior margin of the arms is armed with a strong acute spine, which is denticulated along its margins. The outer surface of the hands is somewhat granular on its proximal half; the upper margin of the palm presents two or three oblique, minutely-granulated lines, but no trace of pectinated ridges. The convex, slightly granular, inner surface of the palm presents no trace of the granulated crest found in *S. intermedia*. The fingers are smooth externally as well as internally; the upper margin of the mobile finger is also smooth, but a row of nine or ten small red spots may be observed on it, which may perhaps become small tubercles at a more advanced age. The ambulatory legs agree with those of *S. intermedia*. The specimen is preserved in alcohol, and the upper surface of the cephalothorax of a dark greenish colour, the anterior legs being yellowish and the ambulatory legs greyish. The distal ends of the propodites are, however, marked with a fine violet colour, and the upper surface of the carpopodites and of the hands of the chelipedes are beautifully marked with small red spots.



D^r De Man del.

1–4. SESARMA ANDERSONI.   5, 6. S. EDWARDSI var. CRASSIMANA.

Crowther lith.   7–9. S. [illegible].   10. CLISTOCOELOMA MERGUIENSE.   Mintern imp.

	millim.
Distance between the extraorbital teeth	11¾
Length of the cephalothorax	9¾
Breadth of the front	6½

102. **Sesarma Edwardsi**, n. sp. (Pl. XIII. figs. 1–4.)

I have much pleasure in dedicating this new species to Prof. A. Milne-Edwards, by whose kindness I have been enabled to study many typical specimens of this difficult genus preserved in the Paris Museum.

The collection contains 58 specimens of this species. Forty specimens were collected on Sullivan Island, and of these 29 were obtained in fresh and brackish water, and eleven from underneath stones on a hillside above a stream. Four of the individuals found in water were infested with *Sacculinæ*. Four specimens were obtained in Elphinstone Island. The labels which accompanied the twelve remaining specimens have been lost.

This species, together with its variety *crassimana*, belongs to the division of this section of the genus in which the distance between the extraorbital teeth is greater than the length of the cephalothorax, and in which the cephalothorax is scarcely convex longitudinally, and has its lateral margins completely parallel. The upper margin of the arms of the anterior legs does not terminate in an acute tooth, and the anterior margin is never armed with a spine. *Sesarma Edwardsi* is therefore closely allied to *Sesarma intermedia*, de Haan, and to *S. sinensis*, M.-Edw.; it may, however, be distinguished by the form of the male abdomen, which is much more enlarged, and by the structure of the anterior legs, the carpopodite being armed, at the internal angle of the upper surface, with a short, acute, depressed tooth, which is not found in *S. intermedia* and *S. sinensis*, and by the inner surface of the palm never presenting a transverse granulated ridge.

The cephalothorax completely resembles that of *S. sinensis*, in the proportion of the distance between the extraorbital teeth to the length of the cephalothorax, and in the proportion of the distance between the extraorbital teeth to the breadth of the front, the former being as 9 : 8, and the latter as 11 : 6, in both species. Sometimes the latter proportion is as 11 : 6½, but this is an individual variation. The upper surface is as little convex as that of *S. sinensis*, and presents quite the same structure. The interregional grooves are rather well indicated, and the whole upper surface is punctate and marked, especially anteriorly, with numerous transverse, piliferous rugosities. The front is a little broader than half the distance between the extraorbital teeth, is somewhat granulated, nearly vertically deflexed downwards, and presents a horizontally prominent anterior margin. In *S. sinensis* this margin is widely emarginate in the middle, and the lateral lobes are rounded; in this new species the median sinus is equally deep, but a little narrower, and the lateral lobes are sinuous or slightly emarginate. The four epigastric (or postfrontal) lobes are as prominent as in *S. sinensis*, and separated from one another by rather deep incisions; the internal lobes are a little broader than the external, and do not hide the frontal margin when the carapace is viewed from above. The lateral margins are perfectly parallel to one another, as in *S. sinensis*. A small second (epibranchial) tooth is present behind the extraorbital tooth, but there is no trace of a third. The upper surface as usual is marked, laterally, with many oblique lines.

The male abdomen has a very characteristic form (fig. 2), being unusually enlarged. In its outer appearance it closely resembles the abdomen of *S. picta*, 'Fauna Japonica,' Crust. pl. xvi. fig. 6, but is a little more enlarged. The terminal (=seventh) joint is a little longer than broad at the base; the penultimate joint is extremely enlarged, its posterior margin being even a little broader than three times the length of the joint, which is a little shorter than the terminal joint; the next joint is but little longer, though still broader; the fourth and the third joint are a little shorter than the fifth, and still more enlarged; and the very short second joint is a little longer than the first, being contiguous to the posterior margin of the cephalothorax. Unfortunately the condition of the Paris typical specimen of *S. sinensis* makes it impossible for me to study the form of the abdomen; but the abdomen of *S. intermedia* is much less enlarged than that of this species, and presents a quite different form.

The anterior legs are very similar to those of *S. intermedia*. They are equal to one another, both in the male and in the female, and in the latter they are a little smaller than in the former. Sometimes in male specimens of equal size the anterior legs are of a different size.

The ischiopodites are armed anteriorly with a small, acute, dentiform tubercle. The upper margin of the arms does not, or only indistinctly, terminate in an acute tooth or spine at the distal end; the anterior margin is more or less dilated distally, according to the individuals, and it often presents a small denticulate prominence, as in *S. tæniolata* and in *S. Lafondi*, but never a spine. The under margin of the arm is minutely tubercular. The external surface of this joint is transversely rugose, but the inner and under surfaces are perfectly smooth, the former presenting the ordinary rows of hairs. The upper surface of the wrist is tubercular and armed, at its internal angle, with a short, acute, denticulate, depressed tooth, both in the male and in the female; this tooth is quite absent in *S. sinensis* and *S. intermedia*, and it is therefore a good character for distinguishing these species.

The hands of the male are very similar to those of *S. intermedia*. They are a little more than once and a half as long as high, and the proportion of the (horizontal) length of the fingers to the palm is nearly as 17½ : 15, the fingers being comparatively shorter in this species than in *S. sinensis*. The palm has a convex outer surface, and is everywhere closely covered with smooth granules; these granules appear a little smaller towards the rounded under surface of the hands, and some of them are arranged in a rather indistinct oblique row, about the middle of the outer surface, as in *S. sinensis*, *S. intermedia*, *S. tæniolata*, and *S. tetragona*, M.-Edw. Near the upper margin the granules are a little more acute, but the rest of the upper margin of the palm is quite similar to the outer surface, presenting no trace of pectinated ridges. The convex inner surface of the palm is covered with a few small, acute granules, but it has never the transverse granulated crest which characterizes *S. sinensis* and *S. intermedia*. The outer and the inner surfaces of the fingers are minutely punctate, but the rest is quite smooth; the upper margin of the mobile finger is covered with very small acute teeth or granules, which are arranged irregularly until some distance from the tip. Similar small acute teeth occur also on the under margin of the immobile finger. The tips of the fingers are scarcely excavated, and their inner margins are rather feebly denticulate.

As I have already observed, the hands of some male specimens are smaller than those of other specimens of an equal size. In such specimens they are a little more elongated, being precisely twice as long as broad, and the fingers are a little longer in proportion to the length of the palm; in other respects the hands of these male specimens perfectly agree with those of the type.

The hands of the female are smaller than those of the male, and closely resemble those of the foregoing variety. The hands of the female are a little more than twice as long as high, and the fingers are a little longer in proportion to the palm than in the male; otherwise they present the same structure.

The ambulatory legs are similar to those of *S. intermedia*, the joints being enlarged, whereas in *S. sinensis* they are much more slender. Thus the meropodites of the first pair are not quite twice as long as broad, the proportion of the length of these joints to their breadth (near the distal end) being as 11 : 6. The other joints also completely resemble those of *S. intermedia*. The dactylopodites are somewhat spinulose and hairy along their inner (=posterior) margins.

Dimensions of the largest specimens:—

	♂ millim.	♀ millim.
Distance between the extraorbital teeth ..	20⅓	19½
Length of the cephalothorax (the front included)	18⅔	17⅓
Breadth of the front, measured between the eyes	11¾	10¾

Sesarma Edwardsi is evidently a common species. It is most closely allied to *S. intermedia*, but may be recognized by the enlarged abdomen of the male, and by the structure of the chelipedes, the wrist being armed with a small, acute, depressed tooth at the internal angle, and the inner surface of the palm being not armed with a transverse granular crest.

102 *a*. SESARMA EDWARDSI, var. CRASSIMANA, n. (Pl. XIII. figs. 5–6.)

The collection contains eight specimens (5 ♂, 3 ♀) of a *Sesarma* collected on the mangrove-swamps of Zediwon, which I regard as a variety of the preceding species. These specimens differ from the type specimens of *S. Edwardsi*, above described, in the following characters. The front is a little larger, the proportion of the distance between the extraorbital teeth to the breadth of the front being as 11 : 7; the abdomen of the male is a little less enlarged, and therefore completely resembles the abdomen of *S. picta*, as figured by de Haan, the posterior margin of the penultimate joint being a little less than three times as broad as the length of the joint. The hands of the male differ from those of the type by the palm being a little larger in proportion to the fingers, the latter being quite as long as the palm. The hands are a little higher than half their length, the proportion of the latter to the height being as 16½ : 9½. The inner edges of the fingers are more strongly denticulated, the immobile finger being armed with three rather strong teeth, and with some smaller teeth at the base.

The coloration of the hands is also somewhat different from the type. In the latter the red colour of the palm extends nearly to the tip of the fingers, but in this variety that colour is found only on the palm and at the base of the mobile finger, the fingers being of a yellowish colour.

Dimensions.—

	♂. millim.
Distance between the extraorbital teeth	19¼
Length of the cephalothorax	17¼
Breadth of the front	11¾

103. **Sesarma polita**, n sp. (Pl XIII. figs. 7–0.)

Six fine specimens (4 ♂, 2 ♀) of this interesting species were collected at Sullivan Island.

Sesarma polita is one of the small number of those representatives of the genus in which the cephalothorax is longer than broad, and with two teeth behind the extraorbital tooth. It therefore appears to be allied to *S. oblonga*, v. Mart., from the Philippine Islands, and to some other species. In the form of its legs, this species more or less agrees with *S. atrorubens*, Hess, from Sydney, because the anterior legs are short and granular and the meropodites of the ambulatory legs rather slender and not dilated. The dactylopodites are short, thick, tomentose, and not spinulose, as in *S. rotundata*, Hess. Besides these characters *S. polita* may be recognized at first sight by the upper surface of the cephalothorax being extraordinarily flattened and plain.

The rather thin cephalothorax is longer than broad, the proportion of its length to the distance between the extraorbital teeth, in the adult male, being as 30 : 24½. The upper surface, which is as broad anteriorly as posteriorly, is perfectly flattened and even, both longitudinally and transversely, the postero-lateral regions being only a little declivous. Except the deep grooves which separate the postfrontal lobes from one another, the cervical and branchiocardiac grooves, there are no grooves on the upper surface. The front is a little broader than half the distance between the extraorbital teeth, the proportion of the latter to the breadth of the front (measured between the eye-peduncles), in the adult male, being as 24 : 14. The minutely granulated front has its anterior margin widely emarginate in the middle, presenting therefore on each side a slightly prominent and small lobe; sometimes these lobes are minutely denticulated. The postfrontal lobes are separated from one another by rather deep grooves; they are very prominent, and partially hide the front, when the carapace is viewed from above, though the lobes of the anterior margin are still visible in the groove between the external and internal lobes. The internal lobes are a little broader than the external, and all are very denticulate and spinulous on their cristate anterior margins; the upper surface of these postfrontal lobes is armed, moreover, with some small acute teeth or granules, arranged partly in transverse rows. The rest of the upper surface of the cephalothorax is smooth and shining, though minutely punctate when seen under a magnifying-glass; and, especially near the anterior and the lateral margins, in well-preserved specimens, a few very small tufts of short hairs are observed, which in most specimens, however, are rubbed off. The eyes are comparatively small. The lateral margins are nearly straight and parallel, terminating above the bases of the third pair of legs; behind the acute extraorbital tooth two acute teeth are found, of which the anterior is a little smaller than the extraorbital tooth, whereas the posterior is very small. Though the lateral margins are nearly straight, they appear, however, somewhat undulate, especially in the female, the anterior half of the margin being rather convex and the posterior half somewhat concave; the distance between the third pair of lateral teeth surpasses a little the distance between the extraorbital teeth. The sides of the upper surface do not present the oblique elevated lines which occur in most other species. The posterior margin of the carapace is comparatively narrow, especially in the male, scarcely measuring a third of the distance between the extraorbital teeth.

The third joint of the outer foot-jaws is longer than broad, the proportion of its length to the breadth being as 5 : 3. In the shape of the male abdomen, this species nearly agrees with *S. tæniolata* or *S. bidens* (de Haan, *l. c.* pl. xvi. fig. 4). The terminal joint is a little longer than broad at the base, the penultimate about one half as long as broad at its base, and the following joints appear successively larger and shorter. In the largest female without eggs, and therefore probably not yet full-grown, the terminal somite of the abdomen is only partially pushed into the penultimate.

The anterior legs are very similar to those of *S. Edwardsi*, but the hands are somewhat more elongate. They are equal to one another, as in *S. tæniolata* and *S. Edwardsi*. The ischiopodites are armed anteriorly with a small acute tubercle near the articulation with the arm. The anterior margin of the latter is armed with some acute tubercles and with a somewhat larger acute tooth a little before its distal end; the upper margin is transversely rugose, and the inferior margin is armed with some acute tubercles. The outer surface of the arm is transversely rugose, but the inner and the under surfaces are quite smooth, the former being provided with the usual rows of hairs. The upper surface of the wrist is covered with granules and with minutely granulated oblique lines, and many small acute tubercles are seen along the inner margin. The hands are about twice as long as high, and the fingers are a little shorter than the palm. The convex outer surface of the latter is everywhere covered with small, more or less acute tubercles, which change into minutely granulated, oblique, elevated lines towards the articulation with the wrist. Similar granules are found also on the upper surface of the palm, and the inner margin of its upper surface is armed with some small acute tubercles, of which the distal one, placed near the articulation of the thumb, is somewhat larger and dentiform. The convex inner surface of the palm is granular, but never presents a granulated crest. There is no gap between the fingers, which have a smooth, though somewhat punctate outer surface. The mobile finger is but little arcuate, and its upper surface is armed with many small acute tubercles or teeth, which are found also on the under surface of the index; the fingers, which are slightly excavated before their pointed tips, therefore agree with those of *S. Edwardsi*, but they are less strongly denticulated along their inner margins, presenting only some small teeth, of which the basal ones are a little larger than the others. The chelipedes of the female have quite the same form and structure as those of the male.

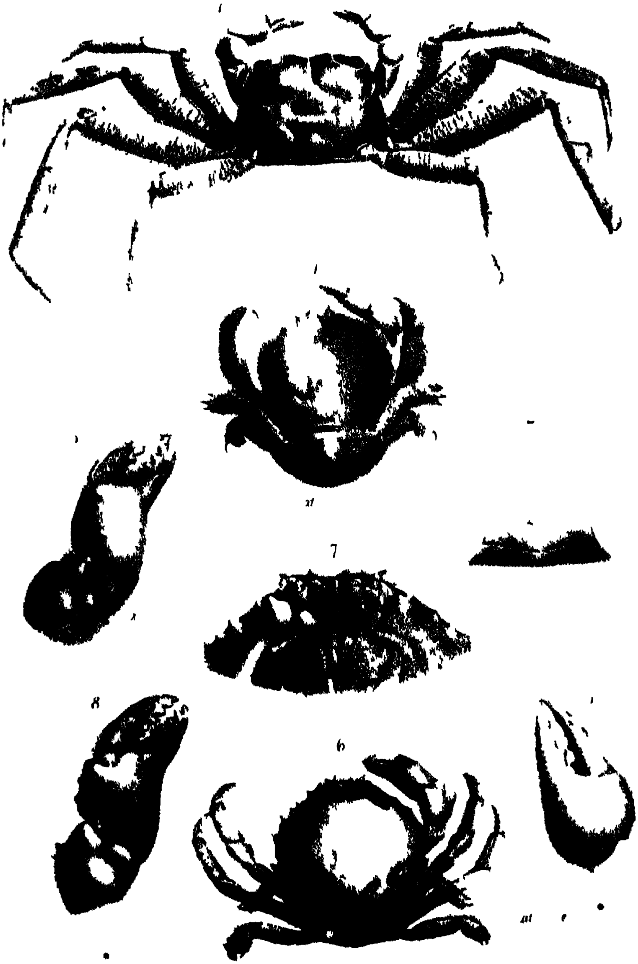
The ambulatory legs seem closely to resemble those of *S. atrorubens*, Hess (Hess, Beiträge zur Kenntniss der Decapodenkrebse Ost-Australiens, 1865, Taf. vi. fig. 12), but the dactylopodites are very short, thick, and tomentose, resembling those of *Sesarma rotundata*, described by the same author. The meropodites are rather slender, being about three times as long as broad; their anterior margin is armed with an acute spine at the distal end, and their outer surface presents a few very small, scattered granules, except on the meropodites of the last pair. The posterior margin of these joints appears entire, except in the first two pairs of legs, in which these margins are a little denticulate near their distal end, somewhat as in *S. rotundata*. The outer surface of the other joints is smooth.

The carpopodites and the propodites have about the same length in the first and in the last pair of ambulatory legs, but the latter are a little longer than the former in the ambulatory legs of the second and third pair. The dactylopodites are very short, thick, and closely tomentose, but not at all spinulous, and they terminate in an acute point; they are much shorter than the propodites, those of the penultimate pair of legs measuring scarcely two thirds of the length of the propodites.

The meropodites bear a few scattered hairs along their posterior margins; the propodites are a little more hairy, and present a tuft of hairs along the distal half of their posterior margins, and the dactylopodites also are clothed with some longer hairs among the short down which is found on their anterior and posterior margins.

Dimensions of the largest specimen:—

	♂ millim.	♀ millim.
Distance between the extraorbital teeth	24⅓	23¼
Length of the cephalothorax..............	30	27½
Breadth of the front between the eyes	14	13¾
Breadth of the posterior margin of the carapace	8½	9½
Length of the meropodites of the last pair of legs	15	14



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	♂. millim.	♀. millim.
Length of the dactylopodites of the last pair of legs	7	6½
Length of the hands	21	18½
Length of the penultimate joint of the male abdomen	4½	

104. Sesarma Kraussi n. sp. (Pl. XIV. figs. 1-8.)

Sesarma longipes, *White, List of the Specimens of Crustacea in the Collection of the British Museum, London*, 1847, p. 39 (*nec Krauss*).

A single male specimen was found at the island of Kisseraing. This species is most closely allied to *Sesarma longipes*, Krauss, from the seas of Natal, and represents it in the Bay of Bengal, the two differing from each other only in subordinate characters. It will therefore be sufficient if I refer to Krauss's description and figure of *Sesarma longipes* (Die Südafrikanischen Crustaceen, Stuttgart, 1843, p. 44, Taf. iii. fig. 2), and point out the distinctive characters of the new form.

The anterior margin of the front, which is nearly straight in *S. longipes*, presents a rather deep median sinus in the Indian species. In *S. longipes* a single tooth is found behind the external orbital angle, but in *S. Kraussi* two teeth are observed behind the extraorbital tooth, the posterior one being very small. The penultimate joint of the male abdomen in *S. Kraussi* is a little longer in proportion to the breadth than in *S. longipes*. The hands of the male are of somewhat different size, the left being the larger. The outer surface of the palm is almost perfectly smooth, but a few minutely granulated lines occur close to the articulation with the wrist; two or three similar lines may also be observed on the upper margin of the palm, but the convex inner surface is nearly smooth, only three or four small tubercles being present near the middle. The fingers have pointed tips; the upper margin and the outer surface of the mobile finger are perfectly smooth, but the outer surface of the index is armed with a longitudinal row of 8–10 small, acute tubercles, with some minute hairs between them, the row proceeding from the base of the finger to near its horny tip. This row of acute tubercles occurs along the middle of the external surface of the index, whilst in *S. longipes* it occurs on the under margin of the finger. Each finger is armed along its inner margin with a somewhat larger tooth at the base, and with some smaller teeth.

Both species, when compared together, may be readily distinguished by the ambulatory legs of *S. Kraussi* being longer than those of the African form. The penultimate pair of ambulatory legs in *S. Kraussi* are about four times as long as the distance between the extraorbital teeth of the carapace, but in *S. longipes* only three times. The joints of these legs are more slender and more elongate than in the African species; and thus the meropodites of the last pair of legs are about thrice as long as broad, whereas in *S. longipes* they are little more than twice as long as broad. So also the propodites of the penultimate pair of legs, the longest of all, are in *S. Kraussi* about five times, but in *S. longipes* only three times as long as broad. The dactylopodites are also more elongate than in the species described by Krauss. The whole upper surface of its carapace is rather coarsely punctate; near the greatly divergent lateral margins it is somewhat hairy, and the sides are marked with a few oblique, elevated, slightly hairy lines, the foremost terminating at the anterior epibranchial tooth. The postfrontal lobes are but little prominent, and do not hide the front, when the carapace is looked at from above; the median groove is very deep, as in *S. longipes*, and the cristate internal lobes are scarcely distinct from the much smaller external ones. The upper surface of the postfrontal lobes is transversely rugose.

Dimensions of the male:—

	millim.
Distance between the external orbital angles	18⅘
Length of the carapace (with the front)	18⅕
Breadth of the front, between the eye-peduncles	6¼
Breadth of the posterior margin of the cephalothorax between the basipodites of the last pair of legs	9½
Length of the larger hand	11
Length of the first pair of ambulatory legs, the shortest of all	29
Length of the third pair of ambulatory legs, the longest of all	52
Length of the fourth (or last) pair of ambulatory legs	32
Length of the propodites of the longest pair of legs	12

	millim.
Length of the dactylopodites of the longest pair of legs	10½

S. Kraussi has been recorded by White from Singapore as *S. longipes*. *S. angustifrons*, from the Sandwich Islands, is a distinct species, being distinguished, according to A. Milne-Edwards, by the inner surface of the hands being armed with a strong transverse crest.

Genus CLISTOCŒLOMA, *Alph. M.-Edw.*

This genus hitherto contained a single species, described by M. Alph. Milne-Edwards, from the shores of New Caledonia. The Mergui collection contains a small species which certainly belongs to the same genus. The *Clistocœlomæ* are closely allied to the *Sesarmæ* proper, but may be distinguished by the shape of the carapace, the antero-lateral margins of which are peculiarly compressed and toothed, and by their external antennæ being excluded from the orbits.

105. CLISTOCŒLOMA MERGUIENSIS, n. sp. (Pl. XIII. fig. 10.)

A single female specimen, without eggs, was collected at Kisseraing Island.

This new form differs from *C. Balansæ* by its comparatively more enlarged carapace and by the form of the front, the external lobes of which are undivided. The rather thin cephalothorax is much broader than long, the proportion of the distance between the external orbital angles to the length of the carapace being as 9 : 7½ (in *C. Balansæ* as 9 : 8¼). The upper surface is a little convex transversely, and the regions are tolerably distinct, although separated by rather shallow grooves; the whole surface is covered with a short, close down, and appears minutely punctate when seen under a strong magnifying-glass. The front is broad, as in *C. Balansæ*, and vertically deflexed; the anterior margin is slightly emarginate in the middle, but does not project horizontally. The postfrontal lobes are little prominent and separated by shallow grooves; the rounded internal lobes are a little broader than the external, which are still less prominent and not divided into two tuberculiform prominences as in *C. Balansæ*.

The anterior half of the lateral margin of the cephalothorax is dentate, extends transversely a little more outward than the equally long posterior portion, and is somewhat compressed; both portions are parallel to one another. The antero-lateral portion being twice emarginate, two teeth are observed behind the obtuse external orbital angle; these teeth have the same size and shape as the extraorbital tooth, being obtuse and rounded. A small tubercle lies nearly on the middle of each postero-lateral region. The pterygostomian regions are reticulated as in *Sesarma*. The third joint of the outer foot-jaws is oval, being scarcely longer than broad. The terminal somite of the abdomen of the female is only partially pushed into the penultimate segment, at least in the specimen before me.

Having no male individuals I cannot describe the chelipedes of that sex; but in the female specimen they are small and equal to one another. They are everywhere clothed with the same down as is found on the upper surface of the carapace, and they are quite unarmed; the convex outer and inner surfaces of the hands are smooth, though rather coarsely punctate, and the upper margin of the palm is armed with a longitudinal crest. The fingers are smooth; the upper margin of the mobile finger is punctate, and both fingers are armed with five or six small teeth which terminate in pointed horny tips.

The ambulatory legs are similar to those of *C. Balansæ*; they are unarmed, covered with a close down, and are somewhat hairy, but the slender, little arcuate dactylopodites are unarmed and scarcely hairy, and gradually taper into a very acute point.

Dimensions of the single specimen:—

	♀. millim.
Distance between the extraorbital teeth	8¾
Length of the carapace	7⅓
Breadth of the front	5½

Subtribe *Oxystomata*.

Family CALAPPIDÆ.

Genus CALAPPA, *Fabr.*

106. CALAPPA PHILARGIUS, *L.*

Calappa (Lophos) philargius, *de Haan, Fauna Japonica, Crustacea*, p. 71, tab. xix. fig. 1.

Cancer philargius, *Linné, Mus. Lud. Ulr.* p. 432.

Cancer inconspectus, *Herbst, Krabben und Krebse*, t. ii. p. 162, Taf. xl. fig. 3.

Calappa cristata, *Fabricius, Suppl. Entom.* p. 346.

Calappa cristata, *Milne-Edwards, Hist. Nat. Crustacés*, t. ii. p. 105, pl. xx. fig. 1.

Two almost adult specimens (♂ ♀) and a very young one were collected.

Calappa philargius inhabits the Indian Ocean (Ceylon), and the Chinese and Japanese seas.

107. CALAPPA GALLUS, *Herbst*.

Cancer gallus, *Herbst, Krabben und Krebse*, p. 46, pl. lviii. fig. 1.

Calappa gallus, *Milne-Edwards, Hist. Nat. Crustacés*, t. ii. p. 105.

A single male specimen was found at King Island Bay.

Calappa gallus has been recorded from Mauritius, the Philippine Islands, and New Caledonia.

Family LEUCOSIIDÆ.

Genus LEUCOSIA, *Fabr.*

108. LEUCOSIA URANIA, *Herbst*.

Cancer urania, *Herbst, Krabben und Krebse*, iii. tab. lxii. fig. 3.

Leucosia urania, *Milne-Edwards, Règne Animal de Cuvier, Crust.* pl. xxv. fig. 1.

Leucosia urania, *Bell, Monograph of the Leucosidæ, Trans. Linn. Soc.* vol. xxi. 1855, p. 283.

? Leucosia longifrons, *de Haan, Fauna Japon.* p. 132, tab. xxxiii. fig. 4.

? Leucosia neocaledonica, *A. Milne-Edwards, Nouv. Arch. du Muséum*, t. x. p. 40, pl. ii. fig. 1.

? Leucosia pulcherrima, *Miers, On the Oxystomatous Crustacea, Trans. Linn. Soc.* ser. ii. *Zool.* vol. i. p. 236, pl. xxxviii. figs. 4–6.

? Leucosia ornata, *Miers, l. c.* p. 236, pl. xxxviii. figs. 7–9; see also *de Man, Notes from the Leyden Museum*, vol. iii. p. 123.

A single female specimen was collected.

The cephalothorax is 17½ mm. long and 16 mm. broad. The upper surface is only sparsely punctate on the front and towards the antero-lateral margins; there are five distinct tubercles in the cavity of the thoracic sinus. The coloration perfectly agrees with Bell's description.

Some time ago when remarking on this species, I pointed out that *L. neocaledonica*, A. M.-Edw., is identical with *L. longifrons*, de Haan, and suggested that these supposed species were also identical with *L. pulcherrima*, Miers, and with *L. urania*, Herbst. To these synonyms I would now add *L. ornata*, Miers, from Ceylon, which is especially distinguished by its carapace being more strongly punctate. This character, however, may prove to be variable in the same way as the granulation of the carapace in some other species of Leucosiidæ (*e. g.* in *Philyra scabriuscula*) is variable.

Leucosia urania inhabits the Indian Ocean, the Chinese and Japanese seas, and occurs also on the shores of New Caledonia.

Genus PSEUDOPHILYRA, *Miers*.

109. PSEUDOPHILYRA HŒDTII, *de Man*.

Pseudophilyra Hœdtii, *de Man, Notes from the Leyden Museum*, vol. III. 1881, p. 125.

? Leucosia pubescens, *Miers*, *Trans. Linn. Soc.* ser. ii. *Zool.* vol. i. p. 238, pl. xxxviii. figs. 22–24 (1877).

A young male specimen was collected in the Mergui Archipelago, which I refer with some doubt to *Pseudophilyra Hœdtii*, described by me five years ago from two specimens captured on the coast of Amboina.

It differs from the type specimens of *P. Hœdtii*, one of which I have before me, in the following characters:—The external angles of the posterior margin of the cephalothorax are not rounded, but rather acute, dentiform, and slightly prominent. Stimpson many years ago proved this to be a youthful character of the Leucosiidæ (Proc. Acad. Nat. Sci. Philad. 1858, p. 159, *Leucosia vittata*).

The hepatic regions are slightly more concave, so that the anterior half of the cephalothorax is a little more produced than in the type specimen of *P. Hœdtii*, and the outer foot-jaws are comparatively a little more elongate, the merus-joints and the palps being a little longer and more slender in proportion to the ischial joints. The anterior legs are scarcely longer than the cephalothorax, whereas, in the adult type specimens, they are about once and a half as long; they present, however, the same distinctive characters.

I presume that these differences are to be ascribed to the youthful state of the specimen; but a careful study of a large series of individuals can alone decide this question.

Having re-examined the type specimen of *P. Hœdtii*, de Man, it seems extremely probable to me that *P. pubescens*, Miers, from Western Australia, is identical with this species. Miers describes the thoracic sinus of *P. pubescens* as having "its anterior margin smooth, not beaded and not defined at either extremity, and having its cavity above the base of the anterior legs filled with a short close pubescence," a description which is applicable to *Pseudophilyra Hœdtii*.

Leucosia vittata, Stimps., from Hong Kong, and *Leucosia rhomboidalis*, de Haan, are also closely allied forms. A thorough revision of the Leucosiidæ, based on a study of all the described type specimens in Museums, is much needed.

The young Mergui specimen is 9½ mm. long and 8 mm. broad.

110. PSEUDOPHILYRA MELITA*, n. sp.

Two male specimens were collected. This species is most closely allied to *Pseudophilyra orbicularis*, Bell = *Leucosia orbicularis*, Bell (Bell, Horæ Carcinologicæ, Trans. Linn. Soc. vol. xxi. 1855, p. 284, tab. xxx. fig. 1), in which the cephalothorax is almost orbicular in form, and the front does not extend as far forwards as the anterior margin of the buccal cavity. This species differs from the foregoing in the front being tridentate, in the palms of the hands being granulated on their inner (anterior or lower) margins, and in the shape of the male abdomen.

Both species closely resemble one another in their outer appearance, not only in their carapaces, which are scarcely longer than broad, but also in their legs, which are slender. The broad front does not extend as far forwards as the anterior margin of the buccal cavity; it is tridentate, the frontal margin having a small acute triangular tooth in the middle, but not projecting beyond the anterior margin of the buccal cavity, whereas the lateral angles are rather obtuse, the front being a little concave between them. The eyes are small. The upper surface is a little convex; each hepatic region rises into a small rounded tubercle, and these regions are thus separated from the front by a concavity.

Although the upper surface appears smooth and shining to the naked eye, with the aid of a lens it is seen to be covered on the middle of the cardiac, intestinal, and branchial regions with a few sparsely scattered, very small granules; anteriorly the surface is very sparsely punctate. The posterior margin is rounded and defined, together with the lateral margins, by a continuous, minutely granulated line, the granules of which become less distinct anteriorly near the hepatic region. The inflected sides of the cephalothorax are quite smooth, presenting no trace of the thoracic sinus and no granules near the base of the chelipedes.

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* *Melita*, one of the Nereids.

The outer maxillipeds have the merus-joint a little shorter than the ischium-joint and acute at its distal extremity; the exognath is broad, though scarcely broader in the middle than the anterior margin of the ischium-joint, with its outer margin a little arcuate and minutely granulate, and with an almost straight anterior margin. The outer surfaces of the outer foot-jaws are minutely punctate.

The male sternum is smooth in the middle, but granular laterally; in the first joint, which borders the buccal cavity posteriorly, the granules are found near the articulation of the chelipedes, but separated from their bases by a smooth space. In the other joints, the granules are found on those portions which border the bases of the legs laterally. The male abdomen is smooth, and is quite similar to that of *P. Perryi*, Miers (Trans. Linn. Soc. 1877, pl. xxxviii. fig. 21), being narrow and triangular, with straight margins; the penultimate joint, however, which is scarcely shorter than the antepenultimate, is quite smooth, and has no tubercular prominence as in *Pseudophilyra Perryi*, Miers. The lateral margins of the cavity which includes the abdomen are also granular, as far as they lie on the first joint of the sternum.

The chelipedes are slender, and similar to those of *P. orbicularis*, Bell, being twice as long as the length of the carapace. The arms are cylindrical, four times as long as broad, and covered on their upper surface with granules, partly arranged in longitudinal rows; but the distal third of the upper surface is nearly smooth, and bears only a few small granules near the anterior margin. The under surface of the arm is equally granular, the granules extending to near its distal end, but they are not arranged in longitudinal series. The wrist is smooth. The hands are quite similar to those of *P. orbicularis*, the palm being twice as long as broad, but the rounded inner (anterior or lower) margin is covered with small granules of unequal size and irregularly arranged. The remainder of the palm is smooth, though sparsely punctate, and the outer (posterior or upper) margin is rounded. The fingers have a punctate surface and the inner edges are sharp, a little hairy and minutely denticulated.

The ambulatory legs are sparsely punctate, but otherwise quite smooth and glabrous.

The cephalothorax of the larger specimen is 10⅓ millim. broad and 11⅓ millim. long (from the posterior margin of the carapace to the anterior margin of the buccal cavity)

Genus PHILYRA, *Leach*.

111. PHILYRA SCABRIUSCULA, *Fabr*.

Leucosia scabriuscula, *Fabricius, Suppl. Entom.* p 349

Philyra scabriuscula, *Milne-Edwards, Hist. Nat. Crustacés*, t. ii. p. 132, pl xx. figs 9 and 10, *Bell, l. c* p. 299; *de Man, Notes from the Leyden Museum*, vol. iii p 126.

A male specimen found at Sullivan Island agrees with my published description of this species quoted above.

In this individual, however, the branchial, cardiac, and intestinal regions are not uniformly covered with granules, as in the Atjeh specimens, described by me (*l. c.*), but a small spot on the middle of the cardiac region and another on either side of the branchio-cardiac sutures are devoid of granules. The granulation of the upper surface of the carapace would therefore appear to be somewhat variable.

Philyra scabriuscula has been recorded from Zanzibar (*Hilgendorf*), Madras (Novara-Reise), Atjeh and Amboina (*de Man*); it may probably therefore be found to occur elsewhere in the Indian Ocean and Malayan Archipelago.

112. PHILYRA PLATYCHEIRA, *de Haan*.

, Philyra platycheira, *de Haan, Fauna Japanica, Crustacea*, p. 132, tab. xxxiii. fig. 6.

There are five specimens (one adult male, three young males, and one sterile young female) of this species in the collection.

The cephalothorax of the adult male is 16 millim. long (the epistome included). In this specimen the upper surface of the cephalothorax is sparsely punctate and under a lens is seen to be minutely granular on the sides of the branchial regions.

In the younger individuals the cardiac and intestinal regions are also minutely granular. The chelipodes of the adult male are twice and a half as long as the length of the carapace, but in the younger specimens, as in those described by de Haan, they are only twice as long. The fingers of the adult male are comparatively shorter in proportion to the length of the palm than those of the younger specimens, and the under margin of the index makes a straight line with the under margin of the palm, the fingers not being curved inwards, as in young specimens. *P. longimana*, Alph. M.-Edw., is apparently closely allied to this species, and is probably only a variety of it.

Although the Mergui specimens present a minute granulation on the postero-lateral surfaces of the carapace, the same as in *Philyra longimana*, I am disposed, notwithstanding, to identify them with *P. platycheira*, which has been recorded by Bell from the Philippine Islands.

Philyra platycheira has hitherto been recorded from Japan, Hong-Kong, and the Philippine Islands as just stated.

Dimensions of two male specimens :—

	millim.	millim.
Length of the cephalothorax	16	7½
Breadth of the cephalothorax............	15¾	7½
Length of the chelipedes	41	15
Length of the arm of the chelipedes	17½	6
Length of the whole hand	17	6½
Length of the palm	11	3¼

113. Philyra globosa, *Fabr.*

(Compared with the typical specimens of Fabricius's *Leucosia globosa.*)

Cancer globosus, *Fabricius, Entom. Syst.* ii. p. 441. n. 9.

Leucosia globosa, *Fabricius, Suppl. Entom. Syst.* p. 349.

Philyra globulosa, *Milne-Edwards, Hist. Nat. des Crustacés*, ii. p. 132, and *Règne Animal de Cuvier*, pl. xxiv. fig. 4.

Philyra globulosa, *Bell, l. c.* p. 300.

This species is represented by six fine specimens, 4 ♂ and 2 ♀.

I have been enabled, by the courtesy of Prof. Möbius, who forwarded to me the two types of Fabricius's *Leucosia globosa*, to compare the Mergui specimens with those invaluable records of the Kiel Museum. The types are a large adult and a smaller female, and both are labelled *Leucosia globosa*, Fabr. In the adult male the carpopodites of the anterior legs are distinctly granular along the inner margin of their upper surfaces, but its hands have a somewhat different appearance from those of the much smaller female. The cephalothorax of the adult male is 29½ millim. long, whilst that of the female is scarcely 17 millim. The hands of the latter completely resemble those of the Mergui specimens; but in the male the hands, and more especially the palm, are comparatively more enlarged and distinctly granular on the inner margin of the palm and of the immobile finger than in the female; the fingers are more deflexed, more strongly denticulated on their inner edges, and more distinctly longitudinally grooved on their outer and inner surfaces; and the mobile finger, moreover, is granular on its upper margin. These differences are doubtless attributable to the large size of the individual, for in its other characters the male perfectly agrees with the female.

I have referred the Mergui specimens to *Philyra globosa*, because they perfectly agree with Fabricius's female type.

The cephalothorax of the Mergui specimens (excluding the epistome) is quite as long as broad; the convex upper surface presents no trace of divisional lines, but in the adult male specimen of Fabricius the branchio-cardiac grooves are faintly indicated. The upper surface is minutely punctate and covered with innumerable minute granules, which become a little more distinct towards the lateral margins.

A continuous beaded line defines the lateral and posterior margins, and the granules forming it are alternately a little larger and smaller, as described by Milne-Edwards. The posterior margin of the cephalothorax is rounded, but in a very young specimen, scarcely 4 millim. broad, a small angular prominence is present on each side, a juvenile character mentioned by Stimpson in his description of *Leucosia vittata*. The front is somewhat less prominent than the epistome, is a little deflexed, and broadly triangular, but rather acute in the middle. The upper orbital margin is marked with one or two fissures. The inflected sides of the cephalothorax are minutely granular. The external margins of the stalks of the outer foot-jaws are granular in both sexes; in the female (not in the male) each stalk presents a longitudinal row of hairs close and parallel to the inner margin. The inner margin of the merus-joint is a little longer than that of the ischium-joint; the exognath is considerably enlarged, being broader than the anterior margin of the ischium-joint. The first joint of the sternum, which borders the buccal cavity posteriorly, is granular in both sexes; in the male the anterior granules are, however, a little larger than the posterior, but in the female this joint is shorter and uniformly covered with large granules. In the male the second joint of the sternum, lying between the bases of the anterior legs, is minutely granular anteriorly, the granules becoming gradually smaller and finally disappearing towards the posterior half, which is smooth; the lateral margins of this joint present somewhat larger granules. The third joint is granulated along its anterior and lateral margins, but is smooth in the middle; the two following joints are nearly completely granular. Those portions of the carapace which lie between the joints of the sternum and the bases of the legs are also coarsely granular.

The lateral margins of the cavity which includes the abdomen are granular. The small portion of the sternum of the female that is not covered by the abdomen is also granular. In the male abdomen the joints are united, except the last or the last two; it is smooth, though minutely and sparsely punctate, and is granulated at its base. In the large typical specimen of Fabricius the penultimate joint of the male abdomen is armed with a small tubercle on the middle of its anterior half. The basal joints of the abdomen of the female are granulated in the same way as in the male.

The anterior legs, as in the adult male specimen of Fabricius, are about twice as long as the cephalothorax. The arms are cylindrical, and are completely covered round their bases with rather small granules, which pass gradually into minute granules on the distal half of the arm, only visible by means of a lens. The carpopodites are minutely granular along the inner margin of the upper surface. In the Mergui specimens the hand is about as long as the arm, and the fingers are nearly as long as the palm; the palm is scarcely more than once and a half as long as broad. The immobile finger is scarcely deflexed. The palm is smooth, though appearing minutely granular on its inner margin, when examined under a magnifying-glass. The fingers are minutely punctate on their outer and inner surfaces, and their sharp, thin, inner edges are faintly denticulated, each presenting two or three small teeth near their tips, whereas the mobile finger has some similarly small teeth along its inner edge.

The ambulatory legs are completely glabrous.

Dimensions of the Mergui specimens :—

	millim.
Length of the cephalothorax (the epistome included)	15
Breadth of the cephalothorax	14¾
Length of the chelipedes	27
Length of the palm	5¾
Breadth of the palm	8¾

The following are the dimensions of Fabricius's large male specimen preserved in the Museum of the University of Kiel * :—

	millim.
Length of the cephalothorax (the epistome included)	29½
Breadth of the cephalothorax	29½
Length of the chelipedes	61
Length of the palm	12½
Breadth of the palm	10

Genus MYRA, *Leach*.

114. MYRA PUNCTATA, *Herbst*.

Cancer punctatus, *Herbst, Krabben und Krebse*, p. 89, pl. ii. figs. 15, 16.

Myra carinata, *Bell, l. c.* p. 297, pl. xxxii. fig. 3.

Myra punctata, *Hilgendorf, Monatsber. d. K. preuss. Akad. d. Wiss. Berlin*, Nov. 1878, p. 811.

Four male specimens of various sizes were collected.

The genus *Myra* without doubt stands much in need of revision, and it is extremely probable that many of the species created by Bell in his Monograph of the Leucosiidæ will not stand the test of revision. The granulation of the upper surface, even in the four Mergui specimens, is not equally developed, but the cariniform median granulated line is distinct in all. In three of them the median spine of the posterior margin is nearly three times as long as the lateral spines, but in the fourth specimen the three spines are about the same size.

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* Prof. Mobius also forwarded to me the type specimen of Fabricius's *Leucosia porcellana*, which has hitherto been regarded by authors as belonging to the genus *Philyra*, and was believed by Bell to be scarcely distinct from *Philyra globosa*. I am now able to state that *Leucosia porcellana* is a true *Leucosia*, somewhat allied to *L. rhomboidalis*, de Haan. In *Leucosia porcellana* there is a large thoracic sinus, the upper surface is smooth and the cephalothorax appears rhomboidal, being, however, less prominent anteriorly than in *L. rhomboidalis*, de Haan. The front is little prominent and triangular. The upper surfaces of the arms only present a few granules at their bases, covered by a tuft of hairs, and the inner margins of the hands are granular. The specimen sent to me was a female; the cephalothorax is 19½ millim. long and 17½ millim. broad.

Dimensions of the largest male specimen :—

	millim.
Length of the carapace (with the central spine)	19
Breadth of the carapace	14½
Length of the chelipedes	33
Length of the arm	18½
Length of the hand	14½
Length of the palm	9½

Myra punctata has hitherto been recorded from the Philippine Islands, the shores of Celebes (*Miers*), and Cape Grenville (Australia).

Family DORIPPIDÆ.

Genus DORIPPE, *Latr.*

115. DORIPPE QUADRIDENS, *Fabr.*

Dorippe quadridens, *Fabricius, Suppl. Ent.* p. 361; *Milne-Edwards, Hist. Nat. des Crustacés*, t. ii. p. 156; *de Haan, Fauna Japonica, Crustacea*, p. 121, Taf. xxxi. fig. 3.

A single male specimen was collected.

Dorippe quadridens, Fabr., is a common species, and is distributed throughout the Indian Ocean, the Malayan Archipelago, along the coasts of Australia, and in the seas of China and Japan.

116. DORIPPE, sp.

A very young specimen in the Collection appears to be allied to *D. granulata*, de Haan, with which, however, I do not venture to identify it, as I do not know whether *D. granulata* occurs in the Bay of Bengal.

Tribe ANOMURA.

Family Dromidiidæ.

Genus Dromidia, *Stimps.*

117. **Dromidia unidentata**, *Rüpp.*, var. (Pl. XIV. figs. 4, 5.)

Dromia unidentata, *Ruppell, Beschreibungen und Abbildungen von 24 Arten kurzschwanzigen Krabben*, 1830, p. 16, Taf. iv. fig. 2.

Dromidia unidentata, *Kossmann, Zoolog. Ergebnisse einer Reise in die Kustengebiete des Rothen Meeres*, II. Halfte, 1. Lief. 1880, p. 67.

Two specimens, an adult female and a young male, which ought probably to be referred to this species, were collected in King Island Bay.

As I was at first unable to identify them with any known species, I sent the female specimen to Dr. F. Richters, of the Museum of Frankfort on the Main, for comparison with Rüppell's types of *D. unidentata*. Dr. Richters kindly compared it with them, and informed me that, in his opinion, the female was a local variety of *D. unidentata*, Rüpp, differing from the four types of Rüppell's species in the following details:—

First, the two lateral teeth of the front are more acute and more straightly directed forward in the Mergui specimen than in those of Ruppell, in which they are more obtuse and more divergent; secondly, that portion of the lateral margin of the cephalothorax lying between the external orbital angle and the cervical suture is more regularly arcuate in Rüppell's typical specimens ("bildet einen volkommeneren Bogen," as Dr. Richters writes) than in the Mergui female, in which the lateral margin is more prominent and therefore more angular.

In Rüppell's typical specimens the inner edge of the mobile finger of the hands is indistinctly dentate, whereas in the Mergui individual it is armed with five or six teeth. Dr. Richters also informs me that the words "superior integer" in Rüppell's diagnosis are not quite exact, the inner edge of the mobile finger being feebly dentate in all the four specimens in the Frankfort Collection.

With regard to the first difference pointed out by Dr. Richters, I would observe that in the young male specimen from Mergui the lateral teeth of the front are a little more divergent than in the female, so that, in my opinion, it is only to the second difference observed by Dr. Richters that some value can be attached. I, however, accept his opinion that the Mergui examples represent a local variety of *D. unidentata*.

The median tooth of the front, which is acute and vertically deflexed, is scarcely visible when the carapace is viewed from above. The upper surface of the cephalothorax is minutely punctate.

The cephalothorax of the female specimen, which bears eggs, is 23 millim. long and 22 millim. broad. It is covered with a large sponge, which is much larger than the Crab itself.

Dromidia unidentata has been recorded from the Red Sea and from Mozambique.

118. DROMIDIA CRANIOIDES, n. sp. (Pl. XIV. figs. 6–8.)

A large male and a much smaller specimen of the same sex were collected, the latter at Elphinstone Island Bay; but the exact locality of the former is unrecorded.

This new species is most closely allied to *Dromidia caput mortuum*, M.-Edw. (Hist. Nat. des Crustacés, t. ii. p. 178); but, according to Prof. Milne-Edwards, who compared the larger specimen with his *Dromidia caput mortuum*, it differs from it in the front being a little less advanced, by the internal angle of the upper orbital margin and the infraorbital lobe being acute, by the protogastric lobes being not at all prominent, by the denticulation of the antero-lateral margins, and by the hands being somewhat spinulose.

The cephalothorax is nearly semiglobose and scarcely longer than broad, the proportion of the length to the breadth (distance between the last antero-lateral teeth) being as 28 : 27. The upper surface is semiglobose, extremely convex in all directions, and its sides therefore slope very steeply to the lateral margins. No divisional lines are found on the upper surface of the cephalothorax except the usual incision in each lateral margin, separating the antero-lateral from the postero-lateral margins, and forming the so-called cervical suture. The upper surface, indeed the entire animal, with the exception of its fingers, is covered with a short, close, velvety pubescence. The upper surface is quite smooth to the naked eye, but is seen to be minutely punctated, when examined under a strong lens. The protogastric lobes are quite indistinct.

The front is strongly deflexed and tridentate (the supraocular teeth not being included). The median tooth is very small, subacute, and being directed perpendicularly downward is only partly visible when the carapace is viewed from above. The lateral teeth are conical, subacute, much larger than the median tooth, and directed forwards and slightly outwards. The internal angle of the upper orbital margin (supraocular tooth, *Miers*), which is rounded and obtuse in *D caput-mortuum*, is rather acute in this species, and its distance from the lateral frontal tooth is quite as great as the distance between the two lateral frontal teeth The external orbital angle is obtuse and scarcely prominent, and is separated by a narrow hiatus from the inferior margin of the orbits, the lobe of which is triangular and acute; the inferior orbital lobe of *D. caput-mortuum* is, on the contrary, very obtuse. The acute internal angle of the upper orbital margin is as far distant from the lateral frontal tooth as from the obtuse, external, orbital angle. The external antennæ are a little more than half as long as the cephalothorax.

The antero-lateral margins are as much longer than the postero-lateral as in *D. caput-mortuum*; they are armed, behind the external orbital angle, with four small acute teeth of nearly equal size. The first antero-lateral tooth is as far distant from the obtuse, little prominent, external orbital angle as the latter is from the internal angle of the upper orbital margin; the second tooth is a little smaller than the first, and its distance from the first is a little less than the distance of the first tooth from the external orbital angle. The third tooth, which is, again, as prominent as the first, is as far distant from the second as the second is from the first [*]; the distance of the fourth tooth from the third is almost twice as great as the distance between the third and the second, and the second tooth is as far distant from the fourth as the fourth is from the cervical suture. The fourth tooth is as prominent as the first and the third. A rather acute tooth, in which the slightly convex postero-lateral margin terminates, occurs immediately behind the cervical suture. The posterior margin of the cephalothorax is nearly as broad as the distance between the first antero-lateral teeth.

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[*] In the small specimen, the cephalothorax of which is only 16 millim. long, the second antero-lateral tooth is situated closer to the first than to the third.

The triangular epistome or interantennular space is in contact with the front. The slightly convex subhepatic and the pterygostomian regions are smooth and unarmed, but a small, subacute tooth occurs at the external angle of the anterior margin of the buccal cavity. The male abdomen is quite similar to that of *D. caput-mortuum*; the terminal joint is exactly once and a half as long as the penultimate, and the posterior margin of the penultimate joint measures twice the length of this joint.

The legs closely resemble those of *D. caput-mortuum*. The chelipedes are equal and smooth. The upper margin of the arm bears a row of five, small, equal, obtuse teeth or tubercles, and similar small tubercles are found on the two other margins. The three surfaces of the arm are smooth. The upper surface of the wrist is smooth; as in *D. caput-mortuum*, the anterior margin of the upper surface, which articulates with the hand, is raised on either side into an obtuse prominence, and the distal half of the inner margin is armed with four small obtuse teeth, which gradually increase a little in size, so that the distal one is the largest. The hands resemble those of *D. caput-mortuum*. Their outer and inner surfaces are smooth, but the upper margin of the palm is armed with two or three small, obtuse teeth. The calcareous fingers are of a beautiful rose-colour, and when closed meet together along their whole length; they are strongly toothed, the inner edge of the mobile finger with five, that of the immobile finger with four teeth, and the teeth of the index are slightly larger than those of the mobile finger.

The surfaces of the other legs are also smooth, and nowhere present nodosities or tubercles. The second and third pairs of legs are about of the same length, and almost as long, as the chelipedes; the fourth pair are only half as long, and the last pair are somewhat shorter and smaller than the legs of the second pair. As already observed, the entire animal, with the exception of the fingers of the anterior legs, which are smooth and glabrous, is everywhere covered with a close velvety pubescence.

Although I have not been able to study the female, I refer this species to the subgenus *Dromidia*, on account of its ridged endostome, and because it completely agrees in its generic characters with *D. unidentata*, Rüpp., which is undoubtedly a true *Dromidia*.

Dimensions of the larger specimen:—

	millim.
Length of cephalothorax, the lateral frontal teeth included	27½
Breadth of cephalothorax (=distance between the fourth or last antero-lateral teeth)	26½
Distance between the acute internal angles of the upper orbital margins	8¼
Distance between the first antero-lateral teeth	17¾
Length of the hand	14½

The smaller individual has a large sponge completely covering its carapace.

Genus Cryptodromia, *Stimps.*

119. Cryptodromia, sp.

The collection contains a young female specimen of a *Cryptodromia*, but I hesitate to refer it to any species. It was captured at King Island Bay, and appears to be allied to *C. lateralis*, Gray.

The cephalothorax is scarcely broader than long, only 5¼ millim. long and 5⅓ millim. broad. The upper surface is very convex longitudinally as well as transversely, and is covered with a short pubescence; the upper surface, except the lateral portions of the cervical suture, presents no interregional grooves. The epigastric lobes are, however, distinctly indicated. The front is rather prominent and three-toothed; the mesial tooth is small, rounded, and deflexed, though distinctly visible when the carapace is looked at from above; the lateral teeth are triangular, obtuse, and directed horizontally forwards. The lateral teeth are separated by a concave margin from the less prominent, internal, orbital angles, which are dentiform and subacute. The external angles of the orbits are also dentiform and subacute. A small subacute tubercle is situated on the upper surface of the hepatic region of the cephalothorax a short distance behind the dentiform external orbital angles. A tubercle of this kind has not been described in *C. lateralis*.

The antero-lateral margins are armed with three teeth, between the dentiform extra-orbital angles and the cervical suture; the first tooth is truncate and placed on the subhepatic or pterygostomian region, a little below the orbits. Between this subhepatic tooth and the tuberculiform external angle of the anterior margin of the buccal cavity another and similar tooth is found on the pterygostomian region, as in *Cryptodromia tomentosa*, Heller (Hilgendorf, Monatsb. Berlin. Akad. 1878, Taf. ii. fig. 5). The second antero-lateral tooth is situated in the middle between the external angle of the orbits and the cervical suture, and is slightly prominent, but obtuse. The third tooth is a little smaller than the second and subacute. A small tubercle occurs immediately behind the cervical suture; the postero-lateral margins of the cephalothorax are slightly convex; the abdomen is unarmed.

The anterior legs or chelipedes are equal. On the upper surface of the wrist there are four tubercles, two in the middle, being longitudinal, oval, and parallel with one another; there are also two other prominences on its distal margin at the articulation with the hand. The internal angle of the wrist is slightly prominent. The upper margin of the hand has also four tubercles, one at the proximal end near the articulation with the wrist, one in the middle, and two close to and above the articulation of the mobile finger; these tubercles are also obtuse, and the one in the middle of the upper surface is longitudinal and oval. The outer surface of the palm is probably granular, but the granules present are wholly concealed under a close pubescence, which also covers the anterior legs. The fingers are smooth and glabrous, and meet along their whole inner margins, which are denticulated, the immobile finger having three or four equal teeth, whereas the mobile finger is more feebly toothed.

The two succeeding pairs of legs are somewhat nodose at the distal ends of their propodites, and the last pair of legs are about once and a half as long as those of the penultimate pair. All these legs are covered with the same pubescence and are, moreover, a little hairy.

Family PORCELLANIDÆ.

Genus PORCELLANA, *Lam.*

Subgenus PETROLISTHES, *Stimps.*

a. Lateral margins of the cephalothorax without an epibranchial tooth.

120. **PORCELLANA INERMIS**, *Heller.*

Porcellana inermis, *Heller, Crustaceen der Novara-Reise*, S. 76, Taf. vi. fig. 5 (nec P. inermis, *Haswell* !).

Porcellana Lamarckii, *Milne-Edwards, Hist. Nat. Crustacés*, t. ii. p. 251, var. (*nec* Porcellana Lamarckii, *Leach*).

Six fine specimens of this species were collected at Owen Island.

I have compared them with a typical specimen of this species, kindly sent me by Dr. C. Koelbel, of the Imperial Museum of Vienna, where the typical specimens of the 'Novara' Expedition are preserved.

The cephalothorax is flattened, and is quite as long as it is broad; its upper surface is punctate in the middle and posteriorly, and is marked with faint transverse striæ anteriorly and towards its lateral margins. The front is triangular, with the apex rounded and subconcave above, it presents a mesial furrow, and a shorter oblique one on each side, terminating at the internal angle of the orbits. The front is separated from the gastric region by a slightly elevated transverse crest, interrupted in the middle by the mesial frontal furrow. There is a faint cervical suture separating the gastric region from the rest of the upper surface. There is no epibranchial spine. The lateral margins are slightly cristate anteriorly, the carinæ extending to nearly the middle of the branchial regions The antepenultimate joint of the peduncle of the external antennæ is provided with a small transverse crest.

The anterior legs are subequal. The arm has a blunt tooth at the distal end of the anterior margin and the external * margin of the under surface is armed with a small spinule about its middle. The wrist is nearly as long as the carapace and thrice as long as broad; its anterior margin is armed with three acute teeth, the first at the proximal end, the second a little before the middle, and the third as far distant from the second as the second is from the first. The obliquely rugose posterior margin of the wrist is prolonged at its distal end into a rather acute spine. The hands are much depressed and the inner borders of both fingers are densely hairy. The anterior half of the upper surface of the wrist is covered with flattened granules, which gradually pass into small, curved, transverse, squamiform lines at the posterior half; these granules and lines are bordered with minute hairs. The upper surface of the hands is covered with similar, flattened, piliferous granules and squamiform lines.

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* The external margin is that which articulates with the wrist.

The anterior margins of the meropodites of the ambulatory legs are unarmed, but the posterior margins of the first two pairs are armed with an acute spine near their distal ends. In one large individual the latter margins are armed with two spines at the distal end, as a second smaller spinule occurs between the described one and the articulation. The posterior margins of the meropodites of the third pair of ambulatory legs (the penultimate pair of legs) are unarmed. The propodites of the first three pairs of ambulatory legs are armed with a small spinule in the middle, and with one somewhat larger and with two similar small spinules at the distal ends of their posterior margin; these spinules are all mobile. The dactylopodites of the first three pairs of ambulatory legs are short, terminate in a black horny claw, and are armed on their posterior or inner margins with two or three spinules. The ambulatory legs are somewhat hairy.

The specimens are of a yellowish-red colour, and marked with numerous small red spots on the carapace and on the ambulatory legs, and with some larger red spots on the anterior legs.

Mr. Miers has lately pointed out (Voyage of H.M.S. 'Alert,' p. 269) that the carapace of *Porcellana* (*Petrolisthes*) *Lamarckii*, Leach, from Australia, is armed with an epibranchial spine. I am indebted to Prof. Milne-Edwards for a typical specimen of *Porcellana* (*Petrolisthes*) *Lamarckii*, M.-Edw. (Hist. Nat. des Crust. t. ii. p. 251), from New Ireland, and having carefully examined it, I am disposed to regard this form as merely a variety of *P. inermis*, Heller, as the foregoing typical specimen differs from the Mergui specimens of *P. inermis* only in one character, viz., the presence of two small spinules on the anterior margins of the meropodites of the second and third pair of ambulatory legs.

Petrolisthes hastatus, Stimps., from Japan, seems to be identical with the New Ireland species. If this and the foregoing supposition prove to be true, then this species must bear the name of *P. hastata*, Stimps.

The cephalothorax of the largest Mergui specimen is nearly 12 millim. long.

Porcellana inermis, Heller, has hitherto been recorded only from the Nicobar Islands.

121. PORCELLANA JAPONICA, *de Haan*.

Porcellana japonica, *de Haan, Fauna Japonica, Crustacea*, p. 199, pl. l. fig. 5.

Petrolisthes japonicus, *Stimpson, Proc. Acad. Nat. Sci. Phil.* 1858, p. 241.

Two individuals were collected, the smaller of the two having been obtained in Elphinstone Island Bay.

In this species the middle and posterior portion of the upper surface of the carapace are minutely punctated, whereas its anterior part and its sides are delicately lineolate. An epibranchial tooth is wanting, and the lateral margins of the cephalothorax are rather acute. The anterior margins of the meropodites of the somewhat unequal chelipedes are unilobate at their external angles; the exterior margins of these joints, by which they articulate with the carpopodites, are armed in the small specimen with a small acute tooth in the middle (which was not described by de Haan), but in the larger individual these margins are unarmed. The carpopodite is quite as long as the carapace; its anterior margin is armed, in both specimens, with only one small acute tooth, situated at the proximal end, and the posterior margin is bispinose, being armed with an acute tooth at the distal end, and with a second placed a little before it. The outer surface of the palm is rather convex, and the fingers are shorter than the palm, especially in the larger hand. They are hairy on their inner margins as in the preceding species.

Porcellana japonica is represented in the seas of New Zealand by *Porcellana elongata*, M.-Edw., a species which may be distinguished from that of de Haan by the upper surface of its carapace being distinctly granulated. *Porcellana inermis*, Haswell (nec Heller), from Port Denison, will probably prove to be identical with *P. elongata*.

Dimensions of the larger specimen:—

	millim.
Length of cephalothorax	8⅕
Breadth of same	7⅔
Length of carpopodite of anterior legs	8⅓
Length of larger hand	15⅓

Porcellana japonica has hitherto been recorded only from the Japanese and Chinese Seas (de Haan, Stimpson).

β. Lateral margins of the carapace armed with an epibranchial tooth.

122. **PORCELLANA DENTATA**, *M.-Edw.*

Porcellana dentata, *M.-Edwards, Hist. Nat. Crustacés*, t. ii. p. 251.

Porcellana bellis, *Heller, Crustaceen der Novara-Reise*, p. 76, Taf. vi. fig. 4.

Petrolisthes Haswelli, *Miers, Report Zoology Voyage of H.M.S. 'Alert,'* 1884, p. 269, pl. xxix. fig. A.

Fourteen specimens were collected, of which eleven were obtained at Owen Island and three at Sullivan Island.

I was enabled by Dr. C. Koelbel, of Vienna, to study one of Heller's types of *P. bellis*, and thus found out that the Mergui specimens were specifically identical with it. I then sent one of the Mergui specimens to Prof. Milne-Edwards, who informed me that it was identical with *Porcellana dentata*, M.-Edw. *Porcellana bellis*, Heller, is thus a synonym of the latter. No doubt, moreover, can be entertained that the Mergui specimens are also representatives of *P. Haswelli*, Miers, from Australia.

Porcellana dentata, M.-Edw., presents the following distinctive characters:—the front is triangular, with the sides a little emarginated, rounded anteriorly, and rather much prominent; it is somewhat deflexed, and has a shallow, longitudinal, mesial furrow. The gastric region is marked anteriorly, at the base of the front, with two transverse linear elevations. The upper surface of the carapace is punctate in the middle and posteriorly, and marked with delicate transverse lines anteriorly and near the sides; these lines, when seen under a strong magnifying-glass, appear to be provided anteriorly with microscopical hairs. Similar piliferous lines occur also in *Porcellana Boscii*, but in it they are much more visible to the naked eye, and the small hairs are also much longer. The lateral margins of the carapace are cristate, and terminate anteriorly in the acute epibranchial tooth. The chelipedes are almost equal to one another. The under margin of the meropodite is armed with a small acute tooth about its middle, and the anterior margin terminates in a rounded lobe at its external angle. The carpopodite measures nearly ⅘ of the length of the carapace, and is nearly twice as long as broad. Its anterior margin is armed with five or six teeth; some of them, however, are often obsolete, and in individuals not fully grown only three or four teeth are found on this margin. The posterior border is more or less spinulose along its whole length, but in most specimens only three or four of the distal spines are more distinctly developed. The outer surface of the hands is rather depressed and covered with minute granules, often arranged in very short transverse or oblique lines, especially near the upper margin, similar to those of the upper surface of the carpopodite. When examined under a strong magnifying-glass, these minute granules appear to be provided anteriorly with microscopical hairs. The fingers are shorter than the palm, and are not hairy along their inner surfaces.

The ambulatory legs are a little hairy. The anterior margin of the meropodites is unarmed, but one or two small teeth are observed at the distal ends of the posterior margins of the meropodites of the second and third pair of legs, those of the fourth pair having the posterior margins unarmed.

Dimensions of our largest specimen:—

	millim.
Length of cephalothorax	11⅓
Breadth of same	11
Length of carpopodite	9
Length of hand	18

The largest specimen observed by Heller had the carapace 14 millim. long.

Porcellana dentata, M.-Edw., has been observed at the Nicobar Islands (*Heller*), on the coast of Java (*Milne-Edwards*), and on the shores of North and North-eastern Australia, appearing thus to inhabit the Malaysian Archipelago and the neighbouring seas.

123. PORCELLANA BOSCII, *Aud.*

Porcellana Boscii, *Audouin, Savigny, Description de l'Egypte, Crust.* pl. vii. fig. 2.

Porcellana Boscii, *Heller, Sitzungsber. der Wiener Akad. der Wissensch.* Bd. xliv. p. 256.

Petrolisthes Boscii, *Kossmann, Zoolog. Ergebnisse einer Reise nach dem Rothen Meeres,* ii. Hälfte, 1e Lief. p. 74.

Porcellana Boscii, *de Man, in Notes from the Leyden Museum,* vol. iii. p. 104.

Porcellana rugosa, *Milne-Edwards, Hist. Nat. des Crustacés,* t. ii. p. 252.

Fifteen specimens were captured at Elphinstone Island Bay, and one in King Island Bay.

In its outer appearance this species closely resembles *P. dentata*, M.-Edw., with which it lives, as is proved by this collection. In the form of the carapace, front, chelipedes, and ambulatory legs, and in the armature of the latter, both species closely resemble each other. *Porcellana Boscii*, however, is distinguished at first sight by the strong development of the minutely granulated, squamiform, piliferous, elevated lines with which the upper surface of the carapace and of the legs is covered. In Audouin's species this remarkable ornament of the carapace and of the anterior legs is distinctly visible to the naked eye, whereas in *P. dentata* the lines are extremely small and short, and only become visible by means of a magnifying-glass.

There are, however, other differences. In *Porcellana Boscii* the inner margins of the fingers are hairy, whilst in *Porcellana dentata* they are smooth and glabrous. In *P. Boscii* the upper exterior margin of the meropodite of each chelipede (by which that joint articulates with the carpopodite) is armed near the posterior end with a small acute spine, which is not found in the other species.

Dimensions.

	millim.
Length of cephalothorax........................	8¾
Breadth of same	8⅓
Length of carpopodite..........................	5⅔
Length of hand	12

Porcellana Boscii has hitherto been recorded only from the Red Sea.

Subgenus PISOSOMA, *Stimps.*

124. PORCELLANA SCULPTA, *M.-Edw.*

Porcellana sculpta, *Milne-Edwards, Hist. Nat. des Crustacés,* t. ii. p. 253.

Pisosoma sculptum, *Stimpson, Proc. Acad. Nat. Sci. Philad.* 1858, p. 228.

Porcellana pulchella, *Haswell, Catal. Australian Crustacea,* 1882, p. 148.

Pachycheles pulchellus, *Miers, Report Voyage of H.M.S. 'Alert,'* 1884, p. 273, pl. xxx. fig. A.

The collection contains a young specimen from Sullivan Island, which I refer to this species.

The upper surface of the carapace is smooth, though sparsely punctate. The front is rather broad, with a straight, truncate, anterior margin. The external orbital angle is acute, and there is no epibranchial tooth. The anterior half of the lateral margins is cristate, but the posterior is rounded and covered with some oblique elevated lines. The chelipedes are unequal, the left being the larger. The carpopodite is scarcely longer than broad, and is armed at its anterior margin with two or three acute teeth; the upper surface is somewhat uneven, presenting some oblique elevations, especially towards the posterior (external) margin. The outer surface of the hands bears three or four somewhat uneven longitudinal ridges, by which two or three longitudinal grooves are formed The upper surface of the carpopodite and the outer surface of the hand are glabrous, but distinctly punctate. The fingers have somewhat curved, acute tips. The inner surfaces of the hands are very convex and also somewhat punctate.

The meropodites of the ambulatory legs are unarmed. The somewhat hairy carpopodites and propodites are longitudinally sulcate on their upper margins, and the acute dactylopodites are armed with two or three short spines on their inner margins.

Dimensions.

	millim.
Length of cephalothorax	8¾
Breadth of same.............	4⅙

The specimen perfectly agrees with the description of *P. pulchella*, Hasw. Mr. Haswell erred in separating his specimens as a distinct species from *P. sculpta*, M.-Edw., in which the anterior margin of the wrist of the chelipedes is armed with two strong teeth, as in *P. puchella.*

P. sculpta, Dana, however, is probably another species, as the anterior margin of the wrist seems to be unarmed.

Porcellana sculpta, M.-Edw., has been observed on the coasts of Java and of Northern and North-eastern Australia.

Subgenus PORCELLANA, *Stimps.*

125. PORCELLANA CORALLICOLA, *Hasw.*

Porcellana corallicola, *Haswell, Catalogue Australian Crustacea*, 1882, p. 150.

Petrolisthes? corallicola, *Miers, Report Voyage H.M.S. 'Alert,'* 1884, p. 271, pl. xxix. fig. C.

A specimen found in Elphinstone Island Bay doubtless belongs to Haswell's *P. corallicola*, which has been more exactly described by Mr. Miers. It agrees with both descriptions except in the following details, viz. that the posterior margins of the wrist and of the hand of the anterior legs are not fringed with hairs, and that the ambulatory legs of the second and third pair are armed in the same manner as those of the first pair. The hairs of the wrist and palm appear to be worn off, as in the specimen described by Miers, in which the carpopodite had also lost its hairs, although the palm was still pubescent on its outer margin. I would also point out that the small spinules with which this animal is everywhere armed may easily be rubbed off.

The specimen is only 4 millim. long, and has the same breadth.

Porcellana corallicola has hitherto been recorded only from North-eastern Australia.

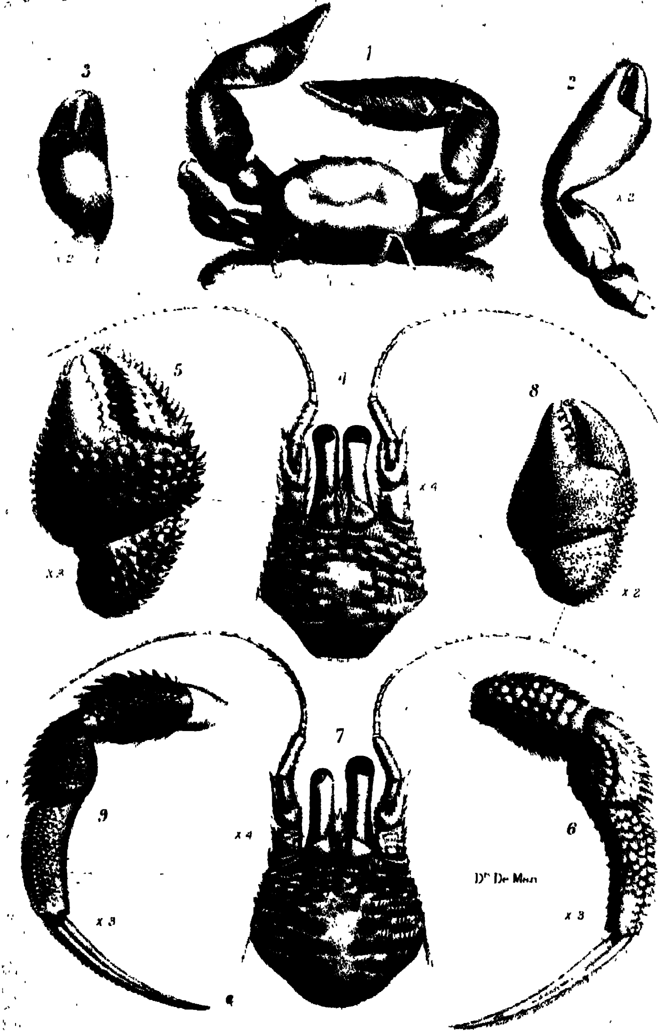
Subgenus PORCELLANELLA, *White.*

126. PORCELLANA PICTA, *Stimpson.*

Porcellanella picta, *Stimpson, Proc. Acad. Nat. Sci. Philad.* 1858, p. 243.

The collection contains twenty-five fine specimens, which were found living on *Pennatulæ* in King Island Bay.

This interesting species is easily distinguished by many striking characters from all other species of the genus. The form of the carapace, which is much longer than broad, the extreme smoothness of its upper surface and of the legs, the flattened tridental front, and the shape of the chelipedes and of the ambulatory legs are distinctive features of this species. The lateral margins of the carapace are rather acute, without an epibranchial tooth. The chelipedes are a little unequal. The carpopodite is but little longer than broad, with smooth entire margins, and with a convex upper surface, smooth and shining to the naked eye, but covered in reality with minute transverse lines. Each hand is slender and elongate, with a convex outer and inner surface, the latter being ornamented at the distal half of the anterior side with a



Guenther lith.   Mintern imp.

1-3 PORCELLANA EUPHROSYNE.
4-6. DIOGENES MERGUIENSIS. 7-9. D. MILES.

thickish line of hairs, originating from the base of the fingers. The fingers are much shorter than the palm, and their pointed tips cross one another; the mobile finger is a little shorter than the index and somewhat distorted. The ambulatory legs are very short, the oval meropodites are but little longer than broad, and are flattened, smooth, and unarmed. The short carpopodites and propodites are equally smooth, and the quadri-unguiculated dactylopodites are very short.

The upper surfaces of the carapace and of the anterior legs are marked with some marginate spots.

Dimensions of an adult specimen:—

	millim.
Length of cephalothorax	10¾
Breadth of same	8
Length of larger chelipede	25
Length of carpopodite	4¾
Breadth of same	3⅕
Length of hand	15
Breadth of same	4⅔
Length of palm	11

Porcellana picta was originally found at Hongkong as a parasite on *Pennatulæ*.

I am unable to determine wherein *Porcellanella triloba*, White (Voyage of H.M.S. 'Rattlesnake,' Appendix, p. 394, pl. v. fig. 2), differs from *P. picta*. Haswell's short description of the former (Catalogue of the Australian Stalk- and Sessile-eyed Crustacea, p. 149) is wholly applicable to the latter. It is therefore probable that the two forms may prove to be identical, and in that case the name of *P. triloba* has priority.

Subgenus POLYONYX, *Stimps.*

127. PORCELLANA EUPHROSYNE, n. sp. (Pl. XV. figs. 1–3.)

A fine adult female specimen, without eggs, was found by Dr. Anderson, living along with an Annelid in its tube. This new species is doubtless closely allied to Haswell's *P. transversa* from the eastern Australian coast; and it is a remarkable fact that this species was also found in the siphons of an *Aspergillum*, so that the affinity of these two *Porcellanæ* is even proved by their similar habits of life.

This species undoubtedly belongs to Stimpson's subgenus

Polyonyx, and it seems almost a certainty that Haswell's species is also a representative of this subgenus. It appears to be distinguished from *P. transversa* by the upper surface of the carapace not being lineolate on its posterior half, by the protogastric lobes being not at all prominent, by the shape of the front, by the distinctly crested lateral margins, by the absence of a conical tooth at the base of the immobile finger of the hands, and probably by other characters, which will become manifest when both species are compared with one another.

P. Euphrosyne belongs to that small number of species in which the cephalothorax is much broader than long, the proportion of the breadth to the length being the same as in *P. transversa*. The upper surface is very convex longitudinally, and the lateral regions are very declivous towards the lateral margins, but the middle of the cephalothorax is transversely flattened. The regions are faintly indicated, and the upper surface is smooth and glabrous, except near the lateral margins, which are densely hairy. The front is rather narrow, measuring only a fourth of the breadth of the cephalothorax; it presents a much deflexed, scarcely prominent, subacute, median lobe, which projects a little more forward, *i. e.* more downwards, than the rounded lateral angles, which are formed by the internal angles of the orbits. The front is somewhat hairy above. The fronto-orbital margin therefore resembles somewhat that of *P.* (*Polyonyx*) *obesula*, White (Miers, Zoology of the Voyage of H.M.S. 'Alert,' 1884, pl. xxix. fig. D), but it is comparatively broader in that species. The orbits are comparatively small, like the eyes themselves; the external angles of the orbits are rounded or obtuse, not at all prominent, and the fronto-orbital margin passes continuously on either side into the lateral margins, which are distinctly carinate and prolonged backwards about to the posterior third. At some distance from the orbits the carinate lateral margins are interrupted by the lateral portions of the cervical suture; but no epibranchial tooth is found at that interruption. The posterior margin of the cephalothorax is slightly concave. The inflected sides of the carapace close to and below and behind the lateral margins are marked with some oblique rugose lines. The external antennæ are about twice as long as the length of the cephalothorax; the first exposed joint is unarmed, the second is a little longer and thinner than the first, and the third is the smallest of all, being only half as long as the second. The external maxillipeds have a quite smooth, glabrous, outer surface, and are fringed along their inner margins with long hairs, those of the last three joints being very long. The abdomen is very long, even much longer than the carapace.

The anterior legs are somewhat unequal, the right being the larger. Except the basipodites, ischiopodites, and the base of the meropodites, the chelipedes are thickly clothed with hairs on their outer (upper) surface, and quite smooth and glabrous on their inner (under) surface, agreeing in this character with *P. transversa*. The anterior legs resemble somewhat those of *P. picta*, Stimps. The upper surface of the meropodite is convex and smooth, though marked with some delicate transverse lines on the distal half, which, however, are only visible by means of a magnifying-glass; this joint, the upper surface of which is densely hairy, except at its base, is armed with a prominent, rounded, minutely denticulate lobe at the distal end of its anterior margin. The wrist is scarcely twice as long as the merus-joint, and its upper surface is once and a half as long as broad; the inner or anterior margin is entire, scarcely arcuate, and projects in the form of a crest, almost as in *P. transversa*. The upper surface of the wrist is smooth, though minutely punctate, and is everywhere thickly clothed with hairs, the posterior margin is also entire. When the fingers are included, the hand is scarcely twice as long as the wrist. The fingers are comparatively short, being scarcely half as long as the palm, and the hand, including the fingers, is rather slender, being three times as long as high. The outer surface of the palm is smooth, although minutely punctate and densely hairy; the under or inner surface is convex, smooth, and glabrous. As in *P. transversa*, the lower border of the palm is marked with a minutely granulated line running to the end of the immobile finger; this granulated line, however, is scarcely visible to the naked eye. The fingers are densely hairy externally, and smooth and glabrous internally, except near their internal edges; they have arcuate pointed tips, which slightly cross one another. The lower border of the immobile finger forms a continuous straight line with the lower border of the palm, this finger not being deflexed. The external margin of the cutting-surface of the immobile finger is faintly crenulate and presents a small prominence a little beyond the middle; a conical tooth, however, is not found at the base of the cutting-surface, which is flattened or even slightly concave. The mobile finger is somewhat rugose or granular and densely hairy above; the external margin of the cutting-edge presents a small transverse tooth at the base and appears, moreover, finely crenulate to near the tip. Near the latter, the inner margin of the cutting-edge is also somewhat crenulate.

The smaller chelipede is similar to the larger, but the fingers are a little longer in proportion to the palm. The three following pairs of ambulatory legs successively decrease in length; the anterior pair are the longest, measuring about once and a fourth the breadth of the cephalothorax, and the posterior are the shortest. These ambulatory legs are very hairy along their margins, especially along the upper margin. The meropodites and carpopodites are unarmed; the propodites are a little shorter than the carpopodites, and measure about two-fifths of the length of the meropodites. Each propodite is armed on the middle of its under margin with a minute spinule and with three or four similar spinules at the distal end of this margin. The dactylopodites are very short; each terminates in a short, acute, arcuate claw, armed on its upper or external margin with a smaller accessory claw; the inner margin of the dactylopodite presents, moreover, one or two minute spinules. The dorsal accessory claw is directed close to and parallel with the larger terminal claw.

The legs of the fifth pair have the usual form.

This species differs from *P. biunguiculata*, Dana, and *P. obesula*, White, by many characters, *e. g.* in its larger size, in the shape of its hands, the fingers of which are much shorter than the palm, in the structure of its ambulatory legs, in the animal being clothed with hairs, &c.; *Polyonyx sinensis*, Stimps., is doubtless another species.

Dimensions of *Porcellana* (*Polyonyx*) *Euphrosyne*:—

	millim.
Breadth of cephalothorax	13
Length of same	9½
Breadth of front	3¼
Length of larger chelipede	30
Length of wrist of same	8
Length of larger hand	14
Height of palm thereof	5
Length of first pair of ambulatory legs	15½

Family PAGURIDEA.

Genus PAGURUS, *Dana*.

128. PAGURUS PUNCTULATUS, *Oliv.*

Pagurus punctulatus, *Milne-Edwards, Hist. Nat. des Crustacés*, t. ii. p. 222.

Pagurus punctulatus, *Miers. Voyage of H.M.S. 'Alert,'* 1884, p. 555.

One specimen was collected in Elphinstone Island Bay, and a smaller one at Owen Island.

In these specimens the eye-peduncles are nearly as long as the anterior margin of the carapace, whereas Milne-Edwards describes the eye-peduncles as being "beaucoup moins long" than that margin. I am disposed therefore to regard his description as inexact, because those specimens in their other details agree perfectly with the description in the 'Histoire Naturelle des Crustacés.' The eye-peduncles surpass the peduncle of the outer antennæ by the length of the cornea, and they are a little shorter than the peduncle of the inner antennæ.

Pagurus punctulatus has been recorded from nearly the whole Indo-Pacific region, from the Red Sea and Madagascar to Australia and the Sandwich Islands.

129. PAGURUS DEFORMIS, *M.-Edw.*

Pagurus deformis, *Milne-Edwards, Hist. Nat. des Crustacés*, t. ii. p. 222; *Hilgendorf, Monatsber. Berliner Akademie*, Nov. 1878, p. 818.

One female specimen, inhabiting the shell of a *Turbo*, was found at Owen Island.

Pagurus deformis has been recorded from the coast of Mozambique (*Hilgendorf*), the Mauritius and the Seychelles (*Milne-Edwards*), Timor, Amboina, the Anachoretes, New Ireland (*Hilgendorf*), and the island of Oushima, Japan (*Stimpson*).

It is a little doubtful whether the specimen collected at Tahiti and described by Heller (Crustaceen der Novara-Reise, p. 86) really belongs to this species, because Heller describes the terminal joint of the third pair of ambulatory legs as being twice as long as the penultimate, whereas in the true *P. deformis* the terminal joint does not attain that length.

Genus CALCINUS, *Dana*.

180. CALCINUS TERRÆ-REGINÆ, *Hasw.*

Calcinus terræ-reginæ, *Haswell, Catalogue of the Australian Stalk- and Sessile-eyed Crustacea*, 1882, p. 158.

A single representative of this genus, inhabiting the shell of a *Murex*, was found at Elphinstone Island. I regard it as a variety of Haswell's *C. terræ-reginæ*, a species which occurs on the coast of Queensland, Australia.

Three species of the genus *Calcinus* are very closely allied to one another, viz. *C. intermedius*, de Man, from the Red Sea, *C. terræ-reginæ*, Hasw., from Queensland, and *C. nitidus*, Heller, from Tahiti. *Calcinus intermedius* * seems to differ from the Mergui species in the following characters :—The fingers of the larger hand are minutely punctate and nearly as long as the palm in *C. intermedius*, whereas in the Mergui specimen they are distinctly shorter than the palm, and covered with small rounded and flattened granules. The inner surface of the palm of the larger hand is quite smooth in *C. intermedius*, but a little granular towards the base of the immobile finger in the Mergui specimen. The carpopodites of the legs of the second pair are armed with two small spines at the distal ends of their upper margins in *C. intermedius*, but only with one small spine in the Mergui species. The dactylopodites of the ambulatory legs of *C. intermedius* are scarcely shorter than the penultimate joints, but in the Mergui species they are distinctly shorter, those of the second legs measuring two thirds of the length of the propodites, whereas the propodites of the legs of the third pair are 5½ millim., and the dactylopodites 4½ millim. long. The Mergui species is, moreover, differently coloured from the species from Djiddah.

I regard this specimen as a variety of Haswell's *Calcinus terræ-reginæ*, with whose description it completely agrees except in its coloration, and in the armature of the mobile finger of the smaller (right) chelipede. In the Mergui specimen this structure is armed with twelve small teeth placed biserially, as in *C. intermedius*, whereas in the species from the Queensland coast only three or four small teeth are present. In Haswell's specimens of *C. terræ-reginæ*, preserved in spirit, the chelipedes were green, the fingers colourless; the propodites of the ambulatory legs were light dull red, the basal portion of the dactylopodites being dark purple, the distal portion light yellow with a black tip, whereas the rest of the surface was washed with light brown and olive. In the Mergui specimen, also preserved in alcohol, we find the following coloration:—The anterior calcified portion of the upper surface of the cephalothorax is of a fine red colour (a mixture of crimson with rough sienna), the minute scattered punctations, especially of the posterior half, being of a yellowish colour; on each side of the median frontal tooth the frontal margin appears white for a short distance, the external angles presenting again the red colour. The external antennæ are of a beautiful saffron-colour, like the eye-peduncles; but the latter are more reddish-coloured on the basal halves of their upper surfaces, and are provided with a milk-white ring immediately before the cornea. The legs present the same red colour as the gastric region of the cephalothorax; but the carpopodites and the hands of the chelipedes and the last three joints of the legs of the second and third pair are of a darker red; the spoon-like excavated tips of the fingers and the small acute spines at the distal ends of the upper margin of the carpopodites are of a white colour. The minute scattered punctations on the legs are equally white, and the dactylopodites of the legs of the second and third pairs have black tips. I may add that the basipodites of all the legs are marked on their under surfaces with an oval yellowish spot.

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* I am unable to compare the specimen from Elphinstone Island with the typical and only specimen of *C. intermedius*, preserved in the Leyden Museum, because the Museum statutes do not admit of the specimen being sent to me.

New researches will have to decide whether the coloration of the species of the genus *Calcinus* is constant or variable. Perhaps the coloration of the same species will prove to be different in different localities.

Perhaps even Haswell's species may prove to be a colour-variety of Heller's *Calcinus nitidus* from Tahiti.

The cephalothorax of this specimen is 13 millim. long, its anterior margin 4 millim. broad, and the eye-peduncles are 6½ millim. long. I may add that the last two joints of the legs of the third pair are provided with many tufts of long hairs along their under margins, as in *Calcinus Gaimardi* from Amboina.

Genus Diogenes, *Dana*.

181. Diogenes merguiensis, n. sp. (Pl. XV. figs. 4–6.)

Pagurus miles, *Milne-Edwards, in Annales des Sciences Nat.* 2 *sér.* t. vi. p. 284, pl. xiv. fig. 2.

Pagurus miles, *Milne-Edwards, Hist. Nat. Crustacés*, t. ii. p. 235.

Diogenes miles, *Dana, United States Explor. Exp., Crustacea*, pl. xxvii. fig. 9.

Nec Cancer miles, *Herbst, Krabben und Krebse*, t. ii. S. 19, Taf. xxii. fig. 7.

Two fine specimens were collected, a male without definite locality and a female from Elphinstone Island Bay. The latter specimen inhabits the shell of an *Eburna*.

As has been observed by Mr. Miers, the species which Herbst figured as *Pagurus miles* is certainly different from the true *Cancer miles* of Fabricius, and even from the *Pagurus miles* of Milne-Edwards and Dana.

Although *Diogenes merguiensis* appears to be identical with the species described fifty years ago by Milne-Edwards as *Pagurus miles*, I nevertheless propose to describe the anterior part of the cephalothorax and the legs, as some details of structure distinctive of these parts has not been mentioned by Milne-Edwards. I would first direct attention to the circumstance that each of the transverse elevated lines with which the upper surface of the cephalothorax is covered in front of the cervical suture is ornamented anteriorly with a row of a few short stiff hairs; in the same manner, all the more or less acute tubercles and spinules which are found on the chelipedes and on the joints of the other legs are piliferous, being provided anteriorly with transverse rows of similar short, stiff hairs, each row consisting of about five to ten hairs. The frontal region and the peduncles of the eyes and of the antennæ of these specimens tolerably well agree with the figure published by Milne-Edwards. The rostrum is very acute, spinulose, and projects a little beyond the level of the ophthalmic scales. The ophthalmic scales, which are comparatively much larger in this species than in *Diog. miles*, Fabr., are subtriangulate and denticulate along their anterior margin; the median tooth, at the internal angle of this margin, is much larger than the others, which gradually diminish in size towards the lateral angle, and the upper surface of each scale is covered with a piliferous, slightly elevated line. The eye-peduncles scarcely project beyond the penultimate joints of the outer and inner antennæ. They are much shorter than the anterior margin of the carapace, and are a little dilated towards the cornea; each peduncle is marked on its upper surface with two longitudinal, reddish-brown lines. The external antennæ are very hairy. The basal joint of each peduncle, which projects nearly as far forwards as the two triangular prominences of the anterior margin of the carapace, presents a few small spinules on its anterior margin. The next joint, which extends almost as far forwards as the acute tip of the rostrum, is armed with a short spine at the external angle of its anterior margin, but this spine is not represented in Milne-Edwards's figure (*l. c.* pl. xiv. fig. 2). The next or penultimate joint is provided at the base of its upper surface with a small scale which terminates in two spines, which much resemble those in Milne-Edwards's figure, the longer external spine projecting a little beyond the distal end of the penultimate joint, whereas the shorter internal spine scarcely projects so far forwards. As in the same figure, the inner margins of these spines are also spiniferous; but the spinules are more numerous in the Mergui specimens, for in them the external spine is armed with five, and the internal spine with three spinules.

As the foremost of the already described transverse, piliferous, elevated lines on the anterior part of the cephalothorax are minutely spinulose, this region appears somewhat hairy. The anterior margin also is armed with some small spinules between the two lateral spinulose prominences, and some small spinules occur at its external angles. The surface behind the cervical suture is also covered with many long hairs.

The left chelipede is much larger than the right. The arcuate, hairy, upper and internal margin of the meropodite of the larger chelipede is armed with 13–14 small acute spines, all of which are directed forwards; the anterior margin of the upper and external surface is also hairy, and presents a similar number of small spinules, which gradually diminish somewhat in size from the internal to the external angle. This somewhat hairy outer surface of the meropodite is almost wholly flattened and smooth, presenting only some small piliferous spinules and elevated lines on its upper part, in the angle between the anterior and the upper internal margins, and a few piliferous elevated lines near the distal end of the under and external margin. These groups of piliferous lines are united with one another by a longer, piliferous, elevated line, which proceeds close to and parallel with the anterior margin. The under (external) margin of the outer surface is likewise hairy and armed with some small spinules, which gradually change into piliferous tubercles or elevated lines at the proximal end. The inner surface of the arm is quite flattened and smooth, and the somewhat convex under surface is somewhat granular, and covered with rather long hairs.

The whole upper surface of the carpopodite is everywhere covered with piliferous acute tubercles, which gradually change into acute spinules towards the margins; thus the internal margin is armed with two parallel rows of about 11–12 acute spinules, the foremost of which is a little larger than the others. The much smaller internal surface of the wrist, which is also covered with a few piliferous, smooth, and depressed tubercles, gradually passes into the still smaller concave and smooth under surface.

The compressed hand is a little longer than high, the proportion of its length (the fingers included) to its height being about 12 : 9; the lower margin of the immobile finger is in a straight line with the lower margin of the palm. The whole, scarcely convex, outer surface of the palm is covered with small, more or less acute tubercles, which are all piliferous, like those of the preceding joints. These small tubercles gradually change into spinules towards the comparatively short upper margin, which therefore presents two parallel rows of small spinules, an external of eight, and an internal row of five spinules. The under margin of the palm is covered with acute tubercles similar to those of the outer surface. Towards the index these tubercles are arranged biserially close to one another, and this double row proceeds upon the under margin of the immobile finger. The inner surface of the hand also presents some sparsely distributed, piliferous tubercles. The fingers are rather much compressed, and there is no gap between their inner margins. Their outer surfaces present some more or less acute piliferous granules, but their inner surfaces are nearly smooth, though somewhat hairy, especially the inner surface of the index. The upper margin of the mobile finger is armed with a row of about 16–17 acute piliferous spinules, which gradually diminish in size towards the pointed, somewhat hooked tip; at the inner side of this row, a second row of much smaller spinules is seen on the upper margin of the thumb. The inner margins of the fingers are not dentate, but only present some parallel, transverse grooves.

The right chelipede is much smaller and still more hairy. The acute upper margin of the meropodite is clothed with long hairs, and armed at its distal end with three acute spinules. The internal surface appears everywhere smooth and flattened, but the flattened outer surface is covered with some piliferous elevated lines. The under surfaces of the meropodite and ischiopodite are hairy. The internal margin of the upper surface of the wrist is clothed with rather long hairs; the upper surface itself is covered with piliferous acute tubercles or spinules. The hand is very hairy, and its outer surface is also armed with many piliferous acute tubercles and spinules.

As the legs of the second and third pair almost closely resemble one another, I will only describe the right leg of the third pair. All the joints are clothed along their upper margins with long hairs, which are also found along the under margins of the ischiopodite and meropodite. The outer surface of the meropodite is covered with many transverse, piliferous, elevated lines, and its upper margin is armed with a row of sharp spinules. The inner surface of this joint, and that of the carpopodite, appear perfectly smooth. The upper margin of the carpopodite is armed with a row of small spinules, which gradually increase a little in size towards the distal end, and the outer surface is covered with some piliferous elevated lines, arranged longitudinally.

The outer surface of the propodite, which is about four times as long as broad, and somewhat arcuate, is covered with three or four rows of piliferous tubercles, of which those of the upper row are rather acute; the upper margin of this joint presents a row of acute piliferous spinules, and some small, depressed, piliferous granules are also found on its inner surface.

The somewhat arcuate dactylopodite, which is about once and a half as long as the propodite, gradually tapers to its pointed tip. The upper margin of this joint presents some very small spinules along its proximal third; its outer surface is longitudinally sulcate, but its inner surface presents a longitudinal ridge, clothed with hairs, some hairs being also found along its acute upper and under margins.

I may add that the male and female completely agree with one another.

Diogenes penicillatus, Stimps., from Japan, is certainly closely allied to *D. merguiensis*, but may be distinguished from it by its eye-peduncles, which are longer than the peduncles of the external antennæ, by its shorter rostrum, which probably is not spiniferous, and by the structure of its hand, the outer surface of which presents a transverse denticulated crest.

D. rectimanus, Miers, from North Australia, is also a distinct species.

Dimensions of the female specimen:—

	millim.
Length of the anterior part of the upper surface of the cephalothorax, in front of the cervical suture, measured in the median line (without the rostrum)	6
Length of the rostrum	1⅘
Distance between the external angles of the anterior margin of the cephalothorax	6
Length of the larger hand	12½
Breadth of same	9
Length of the meropodite of the right leg of the third pair	6½
Length of the carpopodite of the right leg of the third pair	6
Length of the propodite of the right leg of the third pair	8
Length of the dactylopodite of the right leg of the third pair	12

182. DIOGENES MILES, *Fabr.* (Pl. XV. figs. 7–9.)

Pagurus miles, *Fabricius, Entom. Syst.* 2. 470. 6; *Suppl. Entom. Syst.* p. 412. 6.

Nec Pagurus miles, *Herbst, Krabben und Krebse*, t. ii. p. 19, Taf. xxii. fig. 7.

Nec Pagurus miles, *Milne-Edwards, Annal. des Scienc. Nat.* ii. série, t. vi. 1836, p. 284, pl. xiv. fig. 2; *Hist. Nat. des Crust.* t. ii. p. 235.

Nec Diogenes miles, *Dana, Unit. Stat. Expl. Exp., Crustacea*, pl. xxvii. fig. 9, *a*, *b*.

Nec Diogenes miles, *Haswell, Catalogue Australian Malacostraca*, p. 156.

A single specimen, not provided with eggs, was collected at Sullivan Island, inhabiting, like the preceding species, the shell of an *Eburna*. I refer this specimen to *Diogenes miles*, Fabr., having compared it with the typical specimen of *Pagurus miles*, Fabr., which was sent to me by Prof. Möbius, of Kiel University. The type unfortunately is in an extremely bad state, being broken into many pieces, and some of the fragments, such as the hands of the anterior legs, are missing. The type specimen is much larger than the Mergui individual, the cephalothorax, including the rostrum, being about 32 millim. long. The latter, however, almost completely agrees with the fragments of the type. In the structure of its cephalothorax, rostrum, ophthalmic scales, and antennal peduncles, the Mergui specimen completely agrees with the type of *D. miles* The legs of the two specimens, so far as I can judge from the fragments of them remaining in the type, show striking resemblances, but the dactylopodites of the second and third pairs in the typical specimen are armed above only with one row of acute spinules, whereas in the Mergui specimen two parallel rows are present. Although I am inclined to ascribe this slight difference to the larger size of the typical specimen, I must acknowledge, however, that the identification is inconclusive, as the hands of the typical specimen are not available for comparison, and that further researches are necessary to decide whether I am right in considering the Mergui Crab to be a young individual of *Pagurus miles*, Fabr.

As has already been observed by Mr. Miers, *P. miles*, Herbst, is a distinct species from *P. miles*, Fabr., differing from it by the larger hand having a smooth outer surface, and by the existence of a strong blunt lobe or tubercle on the inner margin of the wrist. *D. miles* of Milne-Edwards, Dana, and Haswell is a third species, which I have described above as new, under the name of *D. merguiensis*. I will first point out some characters by which it will be possible to distinguish this species, as here understood, from *D. merguiensis*.

The rostrum of *D. miles*, Fabr., is comparatively much longer than that of *D. merguiensis*, being almost twice as long as the inner margin of the ophthalmic scales; it is strongly spinulose at its distal half and armed on each side with three or four spinules. The spines in which the basal scale on the upper surface of the penultimate joint of the peduncle of the external antennæ terminates are comparatively shorter in *D. miles*, the internal spine reaching scarcely to the middle of the joint, whereas in *D. merguiensis* the internal spine projects even slightly beyond its distal end. The legs of *D. miles* are less hairy, the palm of the larger hand and the propodites of the legs of the second and third pairs being almost wholly glabrous, their tubercles and spines being not piliferous. The outer surface of the larger hand and also of its fingers are covered in the Mergui specimen (the hands of the typical specimen are missing) with more numerous, though much smaller granules than in *D. merguiensis*. As regards the upper surface of the cephalothorax, both species almost wholly agree with one another, for in *D. miles*, as in *D. merguiensis*, the part which lies before the cervical suture is also covered with transverse, piliferous, elevated lines, of which the anterior ones are minutely spinulose. In the same manner the anterior margin is armed with minute spinules, and similar spinules are found on the lateral margins and at the external angles. The two lateral prominences on the anterior margin are, however, a little less prominent than in *D. merguiensis*. The part of the upper surface behind the cervical suture is covered with hairs.

The acute rostrum extends quite to the middle of the distance between the anterior margin of the cephalothorax and the rounded ends of the eye-peduncles; it is about twice as long as the inner margin of the ophthalmic scales, and it exceeds by its anterior third the inner margin of the antepenultimate joint of the peduncle of the external antennæ. The basal half of the rostrum (between the ophthalmic scales) presents some minute spinules, and the free terminal half is armed on each side with three somewhat larger spinules, whereas the rostrum terminates anteriorly in two spinules. The ophthalmic scales nearly agree with those of *D. merguiensis*, but they are comparatively much smaller in proportion to the breadth of the cephalothorax. The external antennæ are somewhat hairy; the basal or first joint projects as far forward as the triangular teeth on the anterior margin of the carapace, and it is armed at the external angle of its minutely spinulose anterior margin with a small spine. The second or antepenultimate joint perfectly resembles that of *D. merguiensis*, being armed with a spinule at the outer angle of the anterior margin. The two spines in which the basal scale of the upper surface of the following or penultimate joint terminates are shorter than in *D. merguiensis*, the external spine scarcely projecting beyond the distal end of the joint, whereas the internal spine only reaches to its middle. The external spine is armed at its inner margin with about five or six spinules, and the internal with two. The eye-peduncles are marked with similar reddish-brown lines to those apparent in *D. merguiensis.*

The legs much resemble those of the latter species, so that I will only describe their distinctive characters. The meropodite of the larger chelipede is quite similar to that of *D. merguiensis.* Also as regards the carpopodite, both species nearly agree with one another, but in *D miles* the tubercles of the upper surface are somewhat more numerous, smaller, and less piliferous; as in *D. merguiensis,* two parallel rows of somewhat larger acute spinules are found along the inner margin of the upper surface. As regards its shape and form, the larger hand is quite similar to that of *D. merguiensis*; its outer surface, however, is covered, in the Mergui specimen, with much more numerous, much smaller, and quite glabrous granules. In both species the lower margin of the immobile finger makes a straight line with the lower margin of the palm. Towards the upper margin, and near the articulation with the wrist, these granules, however are slightly larger and acute, and the upper margin of the palm presents two parallel rows of acute spinules, much as in *D. merguiensis.* The inner surface of the palm is a little granular and hairy in the middle, being armed with a few sparsely distributed small granules; near the upper margin it presents some acute spinules, and the under surface or margin of the palm is also a little more coarsely granulated. The outer surface of the fingers is covered with much more numerous and much smaller granules than in *D. merguiensis,* and their inner margins are more distinctly dentate. The granules of the fingers, like those of the outer surface of the palm, are not piliferous, but quite glabrous. As in *D. merguiensis,* the inner margins of the fingers on both sides of the teeth present some small tufts of hairs. The upper margin of the mobile finger likewise presents two parallel rows of acute granules, those of the external being much larger than those of the internal row; these granules, however, are much smaller in *D. miles* than in *D. merguiensis,* in which they are more spiniform; they are also more numerous, the external row consisting of about 30 granules, whereas in *D. merguiensis* there are only 16 or 17. They gradually diminish in size towards the pointed, hooked tip. The upper margin presents some few hairs. On the middle of the smooth inner surface of the thumb some small granules are observed, more numerous and smaller than in *D. merguiensis*. Both species very nearly agree in the character of the right chelipede; this leg likewise is very hairy and piliferous, but the external surface of the hand bears smaller and less acute granules than in *D. merguiensis*. The other legs are almost similar in both species, the joints presenting the same form and size as in *D. merguiensis*. The distinguishing characters are the following:—

The outer surfaces of the joints, as on the larger hand, are covered with more numerous, smaller, and less piliferous granules than in *D. merguiensis*, and their upper margins are also less hairy. In comparing the right third pair of legs of both species with one another, I observe that the upper margin of the meropodite of *D. miles* is armed with a row of more numerous and larger spinules than in *D. merguiensis*, and that the upper margin of the dactylopodite in the Mergui specimen of *D. miles* presents two rows of small spinules, of which those of the inner row are a little larger than those of the outer. These rows extend beyond the middle of the dactylopodite. In the larger and typical specimen of *D. miles*, Fabr., as already observed, there is only one row of spinules on the dactylopodite. In *D. merguiensis* there is a single but much shorter row of acute granules along the proximal third of the dactylopodite. The outer surface of the dactylopodite of *D. miles* is longitudinally sulcate, and the inner surface is covered with a few acute granules at its base.

Both species probably grow to the same size, and their carapace and legs have similar dimensions.

133. Diogenes avarus, *Heller*.

Diogenes avarus, *Heller, Crustaceen der Novara-Reise*, p. 83, Taf. vii. fig. 2.

Six specimens were collected in Elphinstone Island Bay. Three were found in the shell of a species of *Nassa*, the fourth in a young *Strombus*-shell, the fifth in a *Cerithium*. The sixth has been removed from its shell; it is very young, and the carpopodite and the hand of its larger chelipede are not yet as elongated as in the adult.

Diogenes avarus has been recorded from the Nicobar Islands.

134. Diogenes, sp.

The collection contains yet a fourth species of this genus represented by a very young specimen, inhabiting a *Nassa*-shell, found in Elphinstone Island Bay. I hesitate to determine it, because young specimens differ much from the adult. It seems, however, to be allied to *Diogenes senex*, Heller, a species from Sydney, distinguished at first sight from *D. avarus* by the larger hand being very pilose.

Genus CLIBANARIUS, *Dana*.

A. Dactylopodites of the legs of the second and third pair distinctly longer than the propodites.

135. CLIBANARIUS INFRASPINATUS, *Hilgend.*

Pagurus (Clibanarius) infraspinatus, *Hilgendorf, Crustaceen von Ost-Afrika*, 1869, p. 97 (footnote).

Six fine specimens of this common Indian species were collected; four of them are without definite locality, and inhabit shells of *Pyrula*, whereas the two others were found in King Island Bay one of the latter has no shell, and the other much smaller individual inhabits a *Buccinum*.

Dr. Hilgendorf has kindly compared a specimen for me with his types of *Clibanarius infraspinatus* from Singapore in the Berlin Museum, and communicated me some remarks about this species and *C. vulgaris*, Dana (= *Cancer clibanarius*, Herbst).

According to Dr. Hilgendorf, the latter species, which was adopted by Dana as the type of his genus *Clibanarius*, and named by him *Clibanarius vulgaris*, is closely allied to *C. infraspinatus*, Hilgendorf, and only differs from it by the arms of the anterior legs not being armed with a spiniform tubercle at the proximal end of the inner margin of the under surface. The large typical specimen of *Cancer clibanarius*, which Herbst figured (t. ii. pl. xxiii. fig. 1), and which is still preserved in the Berlin Museum, had and still has a uniform red colour, but another specimen in Herbst's collection presents the same coloration as *Clibanarius infraspinatus*. When we consider that the Berlin Museum, since the days of Herbst, has not received a single crab agreeing with his types of *C. clibanarius*, but that numerous specimens identical with *C. infraspinatus* have been frequently added to the collection of that institution, I think we have some reason to regard the old type of Herbst as a mere variety of *C. infraspinatus*. I am therefore inclined to unite both species under the name of *C. vulgaris*, Dana.

I will now describe the largest of the Mergui specimens.

The median rostral tooth of the cephalothorax is rather small, triangular, acute, and in all the specimens it projects a little more forwards than the lateral frontal teeth situated just outside of the bases of the eye-peduncles. The latter are slender and (the basal scales included) about as long as the width of the anterior margin of the cephalothorax; the basal scales are rather small, a little longer than broad, and armed, on their anterior margins, with four acute spinules, the innermost of which is the largest, whereas the others successively decrease in length outwards. The eye-peduncles are longer than the peduncles of the external antennæ, but shorter than those of the internal antennæ. The antepenultimate joint of the peduncle of each external antenna is armed at the internal angle of its anterior margin with an acute minute spinule; a similar spinule is found at the external angle of the anterior margin of the penultimate joint. The spiniform aciculum which projects from the dorsal surface of the penultimate joint, extends a little less forward than the middle of the terminal joint of the peduncle, and is armed on its inner margin with a row of 6–8 acute spinules and with some yellowish hairs.

In some of the specimens the right chelipede, and more especially the right hand, is a little smaller than the left; in most specimens, however, they appear equal at a first sight, but on a more careful examination a slight difference in size is perceptible. In one specimen the difference of size is somewhat more considerable, so that the left chelipede of this individual appears at first sight larger than the other.

In all the specimens the inner margins of the under surfaces of the arms are armed at their proximal ends with a more or less elevated dentiform tubercle, which is not acute, or scarcely so. The wrist is armed above with some acute spiniform teeth, three larger than the others being arranged in a longitudinal row along the inner margin. The hands are covered on their flattened upper surfaces with numerous acute dentiform tubercles, particularly crowded on their rounded outer margins and towards the internal margins of the palms, whereas they are less numerous on the middle of the upper surfaces. Five or six somewhat larger acute teeth are situated, in a longitudinal row, along the inner margin of the upper surface. The under surfaces of the hands are almost smooth. The upper surface of the mobile finger presents two or three longitudinal rows of small, acute, black-pointed spinules; the immobile finger is armed with similar spinules, partly arranged in longitudinal series; the under surfaces of the fingers are nearly smooth. The chelipedes are covered with some yellowish hairs, which are more numerous on the fingers, and arranged on the latter in small transverse tufts, as well on their upper as on their under surfaces.

Each meropodite of the first and second ambulatory legs is armed with an acute spinule at the distal end of the under margin of its external surface near the articulation; but otherwise these joints are unarmed. The carpopodites of the first pair of ambulatory legs present a longitudinal row of acute teeth on their upper margins, of which the distal one is the largest; those of the second pair are only armed with a single acute spine at the distal ends of their upper margins. The propodites are nearly quite unarmed, presenting sometimes only a small acute spinule at the distal ends of their upper margins The slender, somewhat arcuate dactylopodites of these two pairs of legs are longer than the propodites; those of the first pair are once and a half as long as the propodites, and those of the second pair are somewhat longer still. Their upper margin presents a somewhat elevated, smooth, longitudinal ridge; and the under margin is armed with a longitudinal row of 7 or 8 black acute spinules along the distal half. The dactylopodites terminate in acute black points. The ambulatory legs of the first and second pairs are clothed with small tufts of hairs along their upper and under margins, those of the upper margins of the dactylopodites are arranged along the inner side of the longitudinal ridge. The legs of the two posterior pairs are also very hairy.

The coloration of this species is very characteristic. The anterior part of the upper surface of the cephalothorax is of a uniform pale colour and is not marked with longitudinal lines, though it presents in some specimens a few small red spots. The lateral sides of the carapace are a little reddish. The eyepeduncles are of a red colour and marked along the inner margins of their upper surfaces with a narrow longitudinal pale line, proceeding from the cornea to the base; another longitudinal pale line proceeds at the outer side of the upper surface, from the cornea, gradually tapering till near the base of the peduncle.

The red peduncles of the antennæ and antennules are also marked with narrow longitudinal pale lines. The chelipedes are of the same red colour, that is more intense on the upper than on the under surface; the dentiform acute tubercles with which they are armed are of a paler colour and, especially those of the hands, contrast rather strongly with the red ground-colour of the palm. The fingers have subexcavate corneous tips, the upper margins of which are black. The first and second pair of ambulatory legs are also of the same red colour, and are marked, moreover, with longitudinal pale lines bordered by a darker red. The upper margins of the meropodites of the first pair of ambulatory legs are marked on their upper margins with a similar longitudinal pale line; this line divides near the middle of the upper margin into two pale lines, one of which proceeds further forwards on to the upper margin and is continued along the upper margins of the following joints, while the other is directed towards the middle of the external surface of the joint, and is then continued on to the middle of the outer surfaces of the following joints. The ambulatory legs of the second pair are marked with precisely similar lines, except that the outer surfaces of the meropodites are marked moreover with a third longitudinal pale line on the middle of their outer surfaces, which, however, is not continued on to the following joints. The under margins of the joints are also of a pale colour, which is especially distinct on those of the propodites and dactylopodites.

Dimensions of the largest specimen :—

	millim.
Length of the cephalothorax	20
Length of the anterior part of the upper surface, which is bordered posteriorly by the cervical suture	10
Breadth of the front	8
Length of the eye-peduncles	8¼
Length of the hands	14
Breadth of the hands at base	6¾
Length of the meropodites of the right ambulatory legs of the second pair	9
Length of the carpopodites....................	8
Length of the propodites	9½
Length of the dactylopodites	17½

TREASURER's Account for the year from May 1, 1886, to April 30, 1887. (Presented at the Anniversary Meeting, Tuesday, May 24, 1887.)

Receipts and Payments.

Receipts.				£	s.	d.
Balance at Bankers' on 1st May, 1886				381	12	9
Interest on Investments				190	14	0
Admission Fees				288	0	0
Annual Contributions				1260	3	0
Compositions				180	0	0
Sales of Publications:—						
Transactions	£145	16	7			
Journals	116	10	10			
Proceedings and Catalogues	3	1	6			
				265	8	11
Donation				113	10	2
				£2679	8	10

Payments.				£	s.	d.
Taxes and Insurance				22	13	9
Repairs and Furniture				38	0	10
Coals and Gas				69	5	0
Salaries and Commission				431	13	4
Library:—						
Books	£140	6	5			
Binding	82	8	2			
				222	14	7
Expenses of Publications:—						
Printing	£583	15	6			
Illustrations	631	5	5			
Distribution	68	7	4			
				1283	8	3
Miscellaneous Printing and Stationery				65	14	0
Petty expenses (including Tea and Postage)				74	10	4
Investment				150	0	0
Balance at Bankers' on 30th April, 1887				321	8	9
				£2679	8	10

Investments on 30th April, 1887.

	£	s.	d.
Consols	3511	19	0
Metropolitan Board of Works $3\frac{1}{2}$ per cent. Stock	1184	15	11
Great Indian Peninsula Railway 5 per cent. Guaranteed Stock	938	14	0
Do. Do. Do. 4 per cent. Debenture Stock	108	0	0
Forth Bridge Railway Co. 4 per cent. Stock	495	0	0
	£6238	8	11

FRANK CRISP, *Treasurer.*

The foregoing accounts have been examined and found correct.
May 12, 1887.

FRED. V. DICKINS,
WILLIAM CARRUTHERS,
ALBERT D. MICHAEL,
B. DAYDON JACKSON, } *Auditors.*

NOTICE.

The irregularity in the issue of Numbers of the Journals in sequence is due to separate Volumes being issued concurrently.

Journal of Zoology.

Vol. XX., when completed, will contain **Nos. 116 to 125** inclusive.

Of this Vol. there has been published Nos. 116, 117, and 118.

Vol. XXI.—Devoted to the Fauna of the Mergui Archipelago, when completed, will contain **Nos. 126 to 135** inclusive.

Of this Vol. there has been published Nos. 126, 127–128, 129, and 130.

Vol. XXII. will consist only of Dr. De Man's Crustacea of the Mergui Archipelago, commencing **No. 136,** there are now published Nos. 136, 137, 138, and 139, and the Volume will be completed with part 140.

Fellows are requested to compare the Numbers given above with their series before inquiring as to supposed missing Parts.

For issues of Botany, see Notice on back of the Botanical Journals.

Price 4s.

THE JOURNAL

OF

THE LINNEAN SOCIETY.

Vol. XXII. **ZOOLOGY.** No. 140.

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(Part V., with Plates XVI.–XIX., Titlepage, Index, &c.)

See Notice on last page of Wrapper.

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1888.

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Elected 24th May, 1888.

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This consists of nine Fellows (three of whom retire annually) and of the four officers *ex officio*, in all thirteen members. The former are elected annually by the Council in June, and serve till the succeeding Anniversary. The Members for 1888–89, in addition to the officers, are:—

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Note.—The Charter and Bye-Laws of the Society, as amended up to the 21st April 1881, have been reprinted, and can be had on application.

Clibanarius infraspinatus has hitherto been recorded from Singapore, and appears to be common in the Bay of Bengal and in the neighbouring seas.

186. CLIBANARIUS, sp.

The collection contains three small specimens of a *Clibanarius*, collected at Elphinstone Island, and inhabiting shells of *Buccinum* and *Natica*. They are closely allied to *C. infraspinatus*, having the dactylopodites longer than the propodites, but they are readily distinguished by their coloration and by some other characters. They are closely allied to or perhaps even identical with *C. striolatus*, Dana, a species which was recorded by Heller from the neighbouring Nicobar Islands. In *C. striolatus* the left chelipede is a little larger than the right, whereas in these specimens the right is the larger one. The cephalothorax of the largest specimen is scarcely 11 millim. long. The gastric region is 5 millim. long and $4\frac{2}{3}$ millim broad. The median frontal tooth is acute, triangular, and projects scarcely more forwards than the lateral frontal teeth. The eye-peduncles (5 millim. long) are a little longer than the breadth of the anterior margin of the cephalothorax; they are somewhat longer than the peduncles of the external antennæ, and also slightly surpass the peduncles of the internal antennæ. The right chelipede is a little larger than the left. The under surfaces of the arms present no trace of the spiniform tubercles characteristic of *C. infraspinatus*. Each arm is provided with the ordinary small spine at the distal end of the under margin of the outer surface; the wrist is armed with two or three acute spines along the inner margin of the upper surface, the distal spine of which is the largest. The upper surface of the wrist is somewhat uneven or tubercular. The upper surfaces of the hands are scarcely twice as long as broad; four or five acute teeth are found along the inner margin of the upper surface of the palm. The hands and the fingers are somewhat tubercular above. The carpopodites of the second and third pairs of legs are armed as usual with a spinule at the distal ends of their upper margins. The dactylopodites are distinctly longer than the propodites, the propodite of the right leg of the third pair being only 6 millim. long, whereas the dactylopodite is nearly 9 millim., *i. e.* almost once and a half as long as the propodite.

The gastric region and the legs are of a light rose-colour, and the latter are longitudinally striated by delicate red lines, each of the outer and inner surfaces of the joints of the second and third legs being marked with four or five longitudinal striæ of a yellowish red. The legs are somewhat hairy.

187. CLIBANARIUS PADAVENSIS [*], n. sp. (Pl. XVI. fig. 1.)

No fewer than nineteen specimens of this fine new form were collected in King Island Bay. The larger specimens inhabit shells of *Pyrula vespertilio* and *Natica*, and the smaller occur in shells of *Melania*, *Ranella*, and *Cerithium*. *C. padavensis* belongs to the section of the genus which is characterized by the dactylopodites of the legs of the second and third pair being distinctly longer than the propodites. It appears to be closely allied to *C. longitarsis*, De Haan, a Japanese species, which, according to Heller and Hilgendorf, also inhabits the Indian Ocean. This new species, however, may at first sight be distinguished from *C. longitarsis* by its coloration, which presents a striking resemblance to *C. striolatus*, Dana. The latter form, however, differs from *C. padavensis* by its shorter, broader hands, the breadth of which slightly exceeds half their length, whereas in the Mergui species the hands are much more than twice as long as broad. *C. tæniatus*, M.-Edw., is readily distinguished by the longitudinal pale lines bordered with red on the upper surface of the cephalothorax and probably by other characters, as *e. g.* the absence of hairs on the lateral parts of the gastric region, &c. *C. lineatus*, M.-Edw., from the coast of Ecuador, is doubtless a distinct species.

I may add that I sent a specimen to Prof. Milne-Edwards, and that he informed me the species was unknown to him.

The anterior portion of the upper surface of the cephalothorax, which is bordered posteriorly by the cervical suture, is distinctly longer than broad, being, in an adult specimen, 10½ millim. long (the median frontal tooth included) and 9 millim. broad. The gastric region is glabrous and marked with many small impressions, some of which are of an irregular form, whereas the others are round or oval. On each side of the gastric region the upper surface bears some small tufts of rather long yellow hairs, arranged in two or three longitudinal rows. Similar tufts of hair are also observed on the anterior half of the part of the cephalothorax which lies behind the cervical suture. The rostrum

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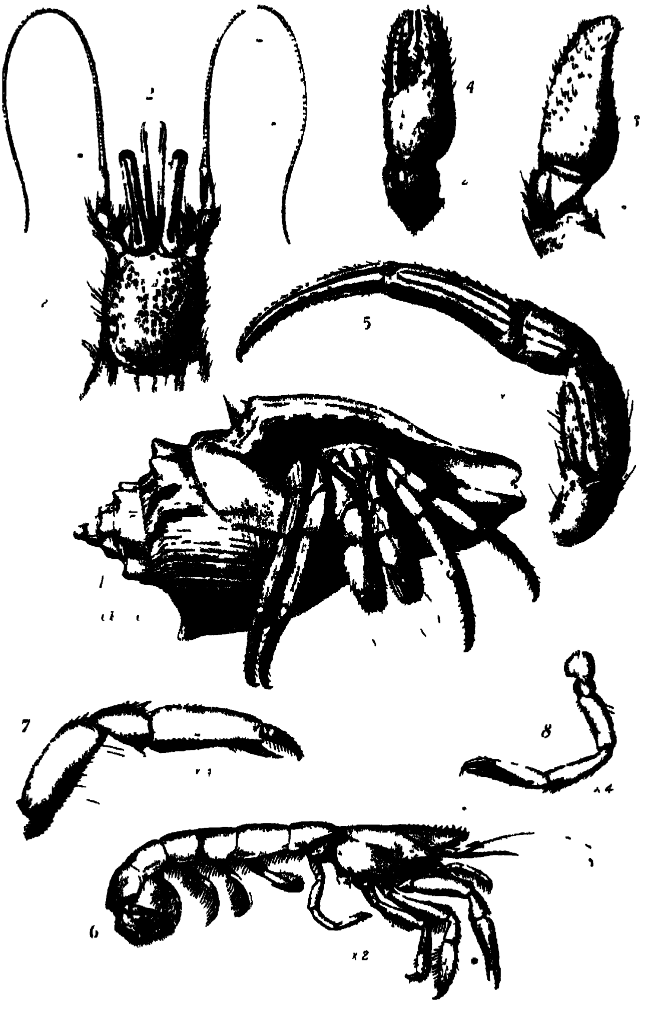
[*] The name given to this new species is taken from Padaw, the native name of King Island



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1–5 CLIBANARIUS PADAVENSIS 6–8 GEBIOPSIS INTERMEDIA

(or median frontal tooth) is small, triangular, depressed, narrow and subacute, but projects nevertheless a little more forwards than the lateral frontal teeth, which are triangular and obtuse. The external angles of the anterior margin of the cephalothorax are rounded. Immediately behind the frontal margin a transverse groove is seen close and parallel to it, bordering anteriorly the gastric region.

The eye-peduncles are very slender and distinctly longer than the breadth of the anterior margin of the cephalothorax, being almost twice as long as the distance between the two lateral frontal teeth. The cornea is small, scarcely measuring a twelfth of the length of the peduncle · but in younger specimens it is comparatively larger. The ophthalmic scales are narrow, dilated at their bases and armed at their distal ends with three or four acute teeth. Tho peduncles of the internal antennæ in the adult are scarcely longer than the eye-peduncles. The antennal peduncles are a little shorter than the eye-peduncles and their penultimate and antepenultimato joints are hairy, the latter joint being armed above at its outer angle with a hairy spine, which projects a little beyond the anterior end of the penultimate joint. The terminal joint is about as long as the two preceding taken together and is a little compressed. The flagella of the outer antennæ are naked.

The abdomen has the ordinary structure and form. The uropoda are asymmetrical and hairy along the margin of their terminal joint; the left is the larger. The external foot-jaws are about as long as the internal antennæ. The anterior legs are equal, and resemble those of *Clibanarius longitarsis*, de Haan. The slightly arcuate upper margins of the arms are unarmed and entire; the external margins of their under surfaces are armed at their distal ends with two small acute teeth, but their inner margins are unarmed and entire The outer surfaces of the arms are covered with many short and small piliferous lines, their inner surfaces are nearly smooth and glabrous; and the smooth, unarmed under surfaces bear a few small tufts of yellow hairs. Similar hairs are also observed on the under surfaces of the basipodites and ischiopodites; their upper margins present also small transverse tufts of similar hairs. The upper margin of the wrist is armed, at its distal end, with a small, acute, dark-pointed spine, which is sometimes accompanied by a still smaller spinule at its internal side. The remainder of the carpopodite is unarmed, with the exception of a few small tufts of hairs along its upper margin, and its outer and inner surfaces. The hands are comparatively elongate, being twice and a half as long as broad. The fingers are once and a third as long as the palm. The palm presents a few small spinules along the inner margin of its upper surface, but is covered otherwise only with some small piliferous lines. The smooth, flattened, and slightly hairy inner surface of the palm makes a right angle with the upper surface; the latter passes gradually into the outer surface, which presents some tufts of hairs, especially along its rounded under margin. The under surface of the palm is smooth and also a little hairy. The fingers have large, spoon-like excavated, horny tips of a black colour, meeting along their whole length, whereas the fingers have a small hiatus between them when closed. The mobile finger is covered on its upper margin with some spinules, a little larger than those of the palm, and arranged in two or three longitudinal rows. The immobile finger also presents similar, somewhat smaller spinules on its upper margin and on its outer surface; but the fingers are unarmed below. The fingers are everywhere rather hairy, the yellow hairs being mostly arranged in longitudinal rows of small transverse tufts. Each finger is armed at its base with two small, acute, conical teeth, situated near the upper margin of the internal cutting-surface, behind one another; the basal tooth, however, is much smaller than the other. The cutting-surfaces are smooth, presenting only a few small tufts of hairs.

The legs resemble those of *Clibanarius longitarsis.* Those of the second and third pairs are rather thinly clad with yellow hairs along their upper and under margins and at their articulations. The basal joints are unarmed, and the meropodites present only a small acute spine at the distal ends of the under margins of their outer surfaces. The carpopodites are armed with a single, small, acute spine at the distal ends of their upper margins. The slender propodites are quite unarmed; those of the right legs are a little longer than those of the left. The slender, slightly arcuate dactylopodites are nearly once and a half as long as the propodites, when measured along their upper margins, and they terminate in short, black, acute points. They present a smooth, narrow, longitudinal ridge along their upper margins, and the distal halves of their under margins are armed with a row of small black spinules. The outer and inner surfaces of these legs are smooth. The legs of the fourth pair are chelate and clothed with long yellow hairs along their upper and under margins. The more slender fifth legs are also very hairy.

This species is beautifully coloured. The cephalothorax and the postabdomen are of a uniform yellowish colour, and are never marked with red longitudinal lines. Each eye-peduncle is marked with three red longitudinal lines, one on its upper, one at its external, and one at its internal side. The antennulary and antennal peduncles are also marked with one or two red lines. The legs are of a white or pale yellowish colour, and marked with many longitudinal lines of dark red. The upper margins of the arms and of the wrists of the anterior legs are bordered on each side by a red line; these two red lines are continued along the inner margins of the upper surfaces of the hands. The outer and inner surfaces of the anterior legs are marked, moreover, with one or two often interrupted, red lines, which in very large individuals are rarely distinct. In order to give a good idea of the coloration of the legs of the second and third pair, I will first describe the coloration of the dactylopodites. On each side of the smooth dorsal ridge, which is white or of a pale yellowish colour, each dactylopodite is marked, on its outer as well as on its inner surface, with two red lines, separated from one another by an equally broad white or pale line. Interrupted traces of a fifth, much narrower line are observed along the under margin. These lines are continued on the propodites, but in such a manner that the two red lines which border the dorsal ridge of the dactylopodite are each divided on the propodites into two lines, which are separated by a rather broad pale yellowish space, and meet again at both ends. The inferior red line of the outer surface of the dactylopodite appears a little broader on the outer surface of the propodite, undivided on the propodites of the third pair, but with a narrow, pale, longitudinal space in its middle on those of the second pair; on the inner surface of the joints this line is, however, also divided into two narrow red lines, with a pale yellowish space between them. The under margin of the propodite is marked with a single red line, which, however, does not reach the proximal end. On the outer surface of the propodites of the legs of the third pair three red lines are therefore observed, besides the red line on the under margin of each, the inferior one being the broadest and undivided (divided by a narrow white space on the propodites of the legs of the second pair); the two superior are narrow and separated by a broad white space, which is even broader than the white space between the middle line and the inferior one. These lines are continued, in the same manner, on the outer surface of the carpopodite, meropodite, and ischiopodite; whereas those of the inner surface are little distinct. The inferior line on the outer surface of the propodites of the legs of the third pair appears, however, to be constantly divided into two lines on the outer surface of the following joints, so that the outer surface of the carpopodites is marked with four narrow red lines, of which the two superior are separated from one another by the broadest white interspace and with a fifth red line near the under margin. The legs of the fourth pair also present some red lines.

In very young specimens the two red lines which are found on the outer and on the inner surfaces of the dactylopodite are not divided into secondary lines on the other joints, but are continued on them undivided.

Dimensions of an adult specimen:—

	millim.
Length of the whole body	49
Length of the cephalothorax	23
Length of the postabdomen	26
Length of the anterior part of the upper surface from tip of rostrum to the cervical suture	10½
Breadth of the anterior margin of the cephalothorax.	8¼
Length of the eye-peduncles	9½
Length of the antennal peduncles	8
Length of the anterior legs	35
Length of the hands, the fingers included	14¼
Breadth of the palm	5¾

	Right leg of the third pair. millim.	Left leg of the third pair. millim.
Whole length of the legs	60	58
Length of the meropodites*	11	10¼
Length of the carpopodites	7½	7½
Length of the propodites	12¼	11
Length of the dactylopodites	18	18

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* All the joints are measured along their upper margins. See the footnote on p. 255.

B. Dactylopodites of the legs of the second and third pair shorter than the propodites, or at least appearing shorter when seen from above.

188. CLIBANARIUS VIRESCENS, *Krauss*.

Pagurus virescens, *Krauss, Südafrikanische Crustaceen*, 1843, p. 56, tab. iv. fig. 3.

Clibanarius virescens, *Hilgendorf, Crustaceen von Ost-Afrika*, 1869, p. 95.

Two specimens were collected at Owen Island. They are without shells. In structure they agree with all the essential characters of the finely-coloured *C. virescens*, Krauss, and are nearly similar in coloration to specimens of the species found on the coast of Natal, presenting only a few slight differences from Krauss's description. The propodites of the legs of the second and third pairs, in these specimens, as in those from Natal, are of an olive-green colour; but in the Mergui specimens this colour is remarkably dark quite at the distal ends of the joints, and the latter are moreover marked at the distal ends of their outer surfaces with a small white spot. The dactylopodites of these legs are yellow-ochre, but are not marked with a green ring in the middle. The olive-green eye-peduncles are marked, on their uppersides, at their distal ends, with a narrow white ring before the cornea.

The cephalothorax of the larger specimen is 9 millim. long.

Clibanarius virescens has hitherto been recorded from the rocky coast of Natal, where it is a very common species, also from Zanzibar, the Red Sea (*Hilgendorf*), and Hongkong (*Heller, Novara-Reise*). This species is therefore probably distributed throughout all the Oriental seas.

189. CLIBANARIUS ÆQUABILIS, *Dana*, var. MERGUIENSIS, n.

Clibanarius æquabilis, *Dana, United States Expl. Exped., Crustacea*, i. p. 464, pl. xxix. fig. 4.

Clibanarius æquabilis, *Heller, Crustaceen der Novara-Reise*, S. 91.

Twenty-four specimens were collected at King Island Bay, inhabiting shells of *Nerita* and *Cerithium*.

Many years ago Dana described and figured two species of the genus *Clibanarius* which are closely allied to one another. One of these species, *C. æquabilis*, was discovered at the Island of Madeira; the other, however, which was called *C. zebra*, inhabits the seas of the Sandwich Islands. *O. æquabilis* was afterwards collected on the coast of Chili ('Novara' Expedition); so we may conclude that this species inhabits the Atlantic Ocean, and *O. zebra* the Pacific. Stimpson described, in 1858, a third species, *C. pacificus*, from Japan. Although closely allied to *C. æquabilis*, it differs from it in the dactylopodites of its ambulatory legs being longer. The Mergui specimens seem to belong to Dana's *C. æquabilis*, as they nearly completely agree with the diagnosis in his 'Conspectus,' and with his figures. The few remarks of Heller on specimens from Chili are also applicable to these individuals. Nevertheless, I anticipate that Mergui specimens will present some slight differences from Madeira individuals, when the two are compared together. I propose therefore to describe them as a variety *merguiensis*. *C. zebra* apparently differs from these specimens in its coloration, its ambulatory legs being longitudianlly striated.

All these specimens, like those collected on the coast of Chili by the 'Novara' Expedition, are of a small size, and scarcely exceed 15 millim. in length. The cephalothorax has a length of 9 millim.; its anterior part, which is bordered posteriorly by the cervical suture, is 4½ millim. long and 4¼ millim. broad. The upper surface of the cephalothorax is rather coarsely punctate, especially the anterior part, the lateral margins of which are clothed with some yellow hairs. The median frontal tooth is small, acute, and projects a little more forwards than the lateral frontal teeth, which are found just outside the bases of the eye-peduncles; in Dana's great work (*l. c.* fig. 4 *d*) the median frontal tooth appears scarcely as prominent as in these specimens. The lateral angles of the anterior margin are rounded. The slender eye-peduncles are scarcely longer than the anterior width of the cephalothorax; they are a little longer than the peduncles of the external antennæ, and also surpass with the cornea the peduncles of the internal antennæ. The small basal scales are armed anteriorly with four or five small acute teeth.

The anterior legs are closely similar to those of *Clibanarius æquabilis*, Dana, *l. c.*, fig. 4, *b*, *c*, and, in a lateral view, also to those of *C. corallinus*, Dana (*l. c.* fig. 8 *c*). The merus-joints are armed with one or two minute, acute teeth at the distal end of the under margin of their outer surface; the anterior margin of the outer surface (not the upper margin), which in *C. corallinus*, Dana, is minutely denticulate along its whole length, is quite entire in these specimens. The wrist is armed with an acute spine at the distal end of the inner margin of the upper surface; the latter is somewhat uneven, and clothed with some yellow hairs. The hands perfectly resemble those of *C. æquabilis*, *C. corallinus*, and *C. zebra*, as regards their form and size; their upper surface is nearly twice as long as broad (the fingers included), and the palm is considerably swollen below. The inner margin of the upper surface of the palm is armed with a row of four or five acute teeth, and the upper surface is covered with some more or less acute tubercles or teeth. These tubercles are more numerous and more acute on the fingers, which have spoonlike excavated tips, and are armed with two or three rather strong teeth along their inner edges. The convex under surface of the hands is rather smooth. The hands and the fingers are rather hairy above and a little so below.

The legs of the second and of the third pairs have a smooth, never granular, surface, which, however, presents many small impressions, in which the hairs with which the legs are clothed are implanted. The meropodites of these legs are armed with one or two acute spinules at the distal ends of the inferior margins of their outer surfaces; the carpopodites present a similar acute spinule at the distal ends of their upper margins. The propodites are unarmed; those of the legs of the second pair and those of the right leg of the third pair have the usual cylindrical form, their outer surfaces being rather convex; the propodite of the left leg of the third pair, on the contrary, has a somewhat trihedrous form, its outer surface being remarkably flattened, so that the upper margin is rather acute. If Dana's figure, 4*f*, of this joint is exact, then these specimens somewhat differ from the Madeira type: in the latter this joint is rather slender, the outer surface being a little more than three times as long as high, and with nearly straight margins; whilst in the Mergui specimens the outer surface is only a little more than twice as long as high and is bordered by a slightly arcuate upper margin. The dactylopodites are compressed, with somewhat convex outer and inner surfaces, except the dactylopodite of the left leg of the third pair, the outer surface of which is flattened or even slightly concave. The dactylopodites of these two pairs of legs are all shorter than the propodites, measuring about three fourths of the latter; they terminate in a black pointed tip, and are armed along their under margin with a row of five or six acute spinules. These legs are hairy along their upper and under margins, and the two posterior legs are also hairy.

They present the following coloration :—The cephalothorax is of a uniform yellowish colour, and not marked with longitudinal lines. The eye-peduncles are each marked above with a red longitudinal line, which in most specimens, however, is no longer visible in consequence of the action of the alcohol. The anterior legs are yellowish red, the teeth and tubercles with which they are covered being yellowish white. The coloration of the propodites and dactylopodites of the legs of the second and of the third pairs is very characteristic. These legs present the same yellowish-red colour as the chelipedes; the outer and inner surfaces of the dactylopodites are, however, of a yellowish white, so that the upper margin is red and the under margin often so. The white colour of the dactylopodites extends more or less upon the outer and inner or upper surfaces of the propodites, but much further upon the propodites of the third pair than upon those of the second pair, often reaching in the former to the proximal end of these joints. The meropodites and carpopodites of the legs of the third pair also often present a yellowish-white spot on their outer surfaces, but not sharply defined. The specimens which were collected in the seas of Chili presented, according to Heller, the same remarkable coloration.

If this species should prove to be distinct from *C. æquabilis*, Dana, of the Atlantic region, I propose for it the name of *C. merguiensis*. It may be distinguished, at first sight, from the other *Clibanarii* of the Indian seas by the coloration of its legs.

140. CLIBANARIUS CRUENTATUS, *M.-Edw.*

Pagurus cruentatus, *Milne-Edwards, Ann. Sci. Nat.* t. x. 1848, p. 62.

Clibanarius cruentatus, *Filhol, Mission de l'île Campbell* (Paris, 1885), p. 424, pl. lii. fig. 4.

One young specimen was found at King Island Bay. This little animal, whose cephalothorax is only 6½ millim. long, is one of those species in which the dactylopodites of the second and third legs are shorter than the propodites. It therefore somewhat resembles *C. æquabilis*; but may be recognized at first sight by its remarkable and beautiful coloration. The gastric region of the upper surface, which is about as long as broad, has a yellowish-red ground-colour, marked with some yellowish-white spots, viz. one spot in the middle anteriorly and six on each side, arranged in two longitudinal rows behind one another. The median frontal tooth is acute, triangular, and projects more forwards than the lateral frontal teeth situated just outside the bases of the eye-peduncles; the median tooth is yellowish white. The slender eye-peduncles are a little longer than the anterior breadth of the cephalothorax, and scarcely more than twice as long as the distance between the lateral frontal teeth. The basal scales are very small and slightly denticulate. The eye-peduncles are somewhat longer than the peduncles of the external antennæ, and surpass the peduncles of the internal antennæ by half the length of the cornea. The peduncles of the external antennæ are yellowish red, and marked with yellowish-white spots. The three anterior pairs of legs are of a beautiful red colour, and covered everywhere with rather large, round, often confluent, yellowish-white spots; the fingers of the chelipedes are more white than red, the former colour being preponderant. The merus-joints of the anterior legs are armed with one or two acute spinules at the distal ends of the under margins of their outer surfaces; each carpopodite presents an acute spine at the distal end of the inner margin of the upper surface, which is otherwise unarmed and smooth. The hands are equal, and their upper surfaces are a little more than twice as long as broad (the fingers being included); the inner margin of the upper surface of the palm is armed with three or four acute spines or teeth, and the upper surfaces of the palm and fingers present a small number of similar acute spines or teeth. The fingers are somewhat denticulate along their inner margins, and have black spoon-like excavated tips.

The meropodites of the second pair of legs are armed with a small acute spinule at the distal ends of the under margins of their outer surface; the carpopodites of the second and third pairs present a strong spine at the distal ends of their upper margin. The dactylopodites of the second and third pairs of legs are shorter than the propodites; they are slender, terminate in rather long black tips, and are armed along their under margins with small acute spinules. The dactylopodite and propodite of the left leg of the third pair are somewhat flattened on their outer surfaces. The legs are clothed with yellowish hairs. The spinules which are found on the legs are all of a yellowish-white colour, similar to the spots with which the legs are covered. Otherwise the legs are smooth and shining.

141. CLIBANARIUS ARETHUSA *, n. sp.

A female specimen was collected in King Island Bay. This species belongs, like the three preceding, to that section of the genus in which the dactylopodites of the second and third legs appear to be shorter, or scarcely as long, but never longer than the propodites, when seen from above; and it is most closely allied to *C. carnifex*, Heller, from the Red Sea, and to the form which I have described above as *C. æquabilis*, var. *merguiensis*. This specimen is nearly twice as large as the specimens of *C. æquabilis*, var. *merguiensis*. As regards the shape and the structure of the cephalothorax and of the postabdomen, *C. Arethusa* closely agrees with that species; but the gastric region is more sparsely and a little less coarsely punctate; the anterior part of the upper surface of the cephalothorax, which lies before the cervical suture, presents some small transverse tufts of rather short yellow hairs except in the middle, and some similar small transverse tufts are also observed immediately behind the cervical suture. The form of the anterior margin of the cephalothorax is completely similar to that of *C. æquabilis*, var. *merguiensis*, the triangular, acute, median tooth projecting a little more forwards than the lateral frontal teeth. The median frontal tooth presents no short ridge above, directed backwards, as in Heller's *C. carnifex*. The slender eye-peduncles are distinctly longer than the anterior breadth of the cephalothorax; they are also much longer than the peduncles of the external antennæ, and quite as long as the peduncles of the internal antennæ. The somewhat hairy ophthalmic scales are very small, narrow, triangular, and armed with two or three small teeth at their tips; they are comparatively smaller than those of *C. æquabilis*, var. *merguiensis*, and are more distant from one another. The external antennæ are similar to those of *C. carnifex* and *C. æquabilis*; the aciculum with which the penultimate joint of their peduncle is armed at its base, which also presents three or four minute spinules along its inner or median margin, does not project beyond the distal end of the penultimate joint, whereas in *C. carnifex* it reaches to the middle of the terminal joint. The penultimate joint is armed with a minute spinule at the outer angle of its distal end. The two basal joints are very hairy, and the flagella are rather short, being scarcely as long as the cephalothorax.

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* *Arethusa*, one of the Hesperids.

The legs are similar to those of *C. æquabilis*, var. *merguiensis*, and probably resemble still more those of *C. carnifex*. The anterior legs are equal and quite similar to those of *C. æquabilis*, var. *merguiensis*, even as regards the distribution of the spinules with which the chelipedes are armed, and hairs with which they are covered. In *C. carnifex* the upper margin of the hands is prominent, like a crest, and armed with four or five acute spinules. In this species such a crest is not found; the hands are scarcely more than twice as long as broad, the inner margin of the upper surface of the palm is not at all prominent, and armed with three or four spinules which are not larger than those of the rest of the upper surface of the palm. The legs of the second pair are similar to those of *C. æquabilis*, var. *merguiensis*, and probably still more resemble those of *C. carnifex*, Heller. These legs have a completely smooth surface, presenting no other punctations than those in which the short hairs are implanted, and which are rather thinly distributed. The propodite of the left leg of the third pair is a little shorter than that of the right, and a little depressed on its outer surface; this outer surface still appears, however, slightly convex. In *C. æquabilis*, var. *merguiensis*, the outer surface of this propodite is much more depressed; so that it appears perfectly flattened, and the upper margin of the outer surface is subacute. The dactylopodites finally are comparatively longer than those of *C. æquabilis*, var. *merguiensis*, and are scarcely as much compressed; they terminate, as in this species, in curved, black, pointed tips, and are armed, on their under margins, with a row of seven or eight acute spinules. As I have already observed, the legs of the second and of the third pairs are thinly clothed with short, stiff hairs arranged in small tufts; those of the fourth pair, on the contrary, are densely clothed with much longer hairs along their margins; and those of the fifth are, again, less hairy. As regards the two or three spinules with which the meropodites are armed, this species completely agrees with *C. æquabilis*, var. *merguiensis*.

Although preserved in spirit, this *Clibanarius* still presents the following characteristic coloration. The anterior part of the cephalothorax lying before the cervical suture is of a uniform greyish ground-colour, presenting, however, faint traces of the red colour of the legs; in the living animal the greyish colour will therefore certainly appear to be mixed with some red. The eye-peduncles and the ophthalmic scales are of an orange-red colour; the corneæ are black and separated from the red colour of the peduncles by a small white ring. The peduncles of the antennæ and antennules are of the same red, whereas the flagella of the outer antennæ are almost uncoloured. The legs are all of an intense orange-red colour, and present even no trace of the white spots which are characteristic of *C. carnifex*, Heller, from the Red Sea, and *C. cruentatus*, M.-Edw., from New Zealand; and whereas the propodites and dactylopodites of the second and third legs of *C. æquabilis*, var. *merguiensis*, are marked, to a certain extent, with a characteristic yellowish white, no trace of this colour is observed on these joints in this species, in which they present the same orange-red colour as the other joints. The excavated horny tips of the fingers and the acute tips of the dactylopodites are black.

Dimensions.

	millim.
Length of the whole body	46
Length of the cephalothorax	16
Length of the abdomen, measured along its upper margin	30
Length of the anterior part of the cephalothorax which lies before the cervical suture	7½
Breadth of the anterior margin of the cephalothorax.	5¾
Length of the eye-peduncles	6¼
Length of the antennal peduncles	5
Length of the antennulary peduncles	6½
Length of the hands	7
Breadth of the hands	3⅓

Length of the last four joints of the second and third legs :—

	Right leg of the 2nd pair. mm.	Right leg of the 3rd pair. mm.	Left leg of the 2nd pair. mm.	Left leg of the 3rd pair. mm.
Meropodites *	7¼	7¼	6⅓	6⅓
Carpopodites	4½	4¾	4	4⅓
Propodites	7	7¼	5⅔	6½
Dactylopodites ..	7	7¾	6¼	7¼

As these dimensions show, the right legs are longer than the left; the right leg of the third pair is the longest of all, and the left leg of the second pair the shortest. The propodites of the two right legs have nearly the same length, those of the two left legs are unequal, the propodite of the left leg of the third pair being a little longer and stronger. Except in the right leg of the second pair, the dactylopodites are slightly longer than the propodites; the dactylopodite of the right leg of the third pair is the longest, the dactylopodite of the left leg of the second pair the shortest of all; and the dactylopodites of the right leg of the second pair and of the left leg of the third pair are almost of the same length.

Genus Cenobita, *Latr.*

142. Cenobita violascens, *Heller.*

Cenobita violascens, *Heller, Crustaceen der Novara-Reise*, p. 82, Taf. vii. fig. 1.

Four specimens were collected. One, inhabiting the shell of a *Turbo*, is adult, and was found in King Island Bay; the other three, one of which is in a shell of *Eburna*, are from Sullivan Island.

According to Mr. Miers ('Annals and Magazine of Natural History' for May 1880, p. 32), this species is probably identical with *Cenobita compressa*, M.-Edw. I believe he is right.

Cenobita violascens was discovered in the Nicobar Islands by the 'Novara' Expedition.

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* These joints were measured along their upper margins; all the dactylopodites, when seen from above, seem to be shorter than the propodites, because their tips are downwardly curved; but the real length of their upper margins, the tips included, are given in this Table; and this length, as a matter of fact, exceeds, in some dactylopodites, the length of the upper margin of the corresponding propodites.

Tribe MACRURA.

Family Gebiidæ.

Genus Gebia, *Leach*.

143. Gebia carinicauda, *Stimpson*.

Gebia carinicauda, *Stimps. Proc. Acad. Nat. Sci. Philadelphia*, 1860, p. 23.

Gebia carinicauda, *Miers, Zoology of the Voyage of H.M.S. 'Alert,'* 1884, p. 280.

A young male specimen was collected at Elphinstone Island. It is only 21 millim. long, whereas adults of the species attain to double the length. In both hands the lower margin of the palm bears a small acute spine at the base of the immobile finger, the latter being scarcely half as long as the mobile finger. The ischiopodites of the anterior legs are armed with two spines. The meropodites of the legs of the first and second pairs are armed with a small spine at their distal ends, and the under margins of those of the chelipedes are also somewhat spinulose. There is a short spine at the base of the legs of the second and third pairs. The antero-lateral margin of the carapace is armed with a small spine between the front and the insertion of the peduncle of the external antennæ. The form of the last postabdominal segment is also distinctive of the species, as it is nearly quadrate, and provided with a transverse crest at a small distance from the anterior margin, and its posterior margin is distinctly narrower than the latter.

I suppose *Gebia hirtifrons*, White, to be a different species, distinguished by the lower margin of the palm not being toothed, and by a somewhat different form of the terminal postabdominal segment, the posterior margin of which has nearly the same breadth as the anterior. The terminal postabdominal segment of *G. maior*, de Haan, is also distinctly broader than long.

Gebia carinicauda has hithertò been recorded from Hongkong and from North Australia; so I conclude that it is distributed throughout the whole Malayan Archipelago.

Genus Gebiopsis, *A. M.-Edw.*

144. Gebiopsis intermedia, n. sp. (Pl. XVI. fig. 2.)

Four adult specimens (2 ♀, 2 ♂) are in the collection, and were found at Elphinstone Island.

I name this species *G. intermedia* because in many of its characters it forms a remarkable transition between the two hitherto known species of the genus *Gebiopsis*, viz. *G. nitida*, A. M.-Edw., from the Cape Verde Islands, and *G. Darwinii*, Miers, from the seas of Australia *.

This new species may be distinguished from *G. Darwinii*, (1) by the comparatively longer peduncles of the internal and external antennæ, (2) by the meropodites of the chelipedes being armed with a row of minute, acute spinules along their infero-internal margins, (3) by the carpopodites of the chelipedes being armed with two strong spines, and (4) by the shape of the last pair of ambulatory legs, which more resemble those of a true *Gebia*.

G. intermedia may be seen at first sight to differ from *G. nitida* by the much shorter peduncles of the internal and external antennæ, and by many other characters. In its general appearance, however, it much resembles that species, not only as regards the body, but also in the shape and the structure of its legs, which is seen on comparing it with the figure of that species in the 'Nouvelles Archives.' The front is very short, horizontal, not at all deflexed, and projects but little beyond the short thick eye-peduncles, of which only the corneæ are visible when seen from above. The front is armed with four equidistant, short, equal, and acute spinules on its anterior margin. The front and the larger anterior half of the gastric region are densely covered with tufts of short hairs, between which they are armed with many acute spinules and granules; the lateral margins of the gastric region are also armed on each side with a row of 14–15 small acute teeth, which gradually increase in size anteriorly, so that the anterior teeth are much larger than the posterior. The cervical suture is broad and deep, and, on each side, the gastric region is bordered by a rather deep longitudinal groove, immediately below and parallel to the rows of small teeth which issue posteriorly into the cervical suture. Behind the cervical suture the dorsal surface of the carapace is smooth in the middle and a little rugose on the sides; its posterior margin is fringed with short hairs. The segments of the postabdomen are smooth, but somewhat hairy

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* Miers (Zoology of the Voyage of H.M.S. 'Alert') mentions another species from the Australian seas, which he proposes to designate *Gebiopsis Bowerbankii*, if specifically distinct; this form, however, seems only to differ from *G. Darwinii* in the armature of the front.

on the sides. The terminal segment exactly resembles that of *Gebiopsis Darwinii* in its general form, having the posterior margin nearly straight, unarmed, and fringed with hairs. The upper surface of this segment bears on each side a longitudinal ridge parallel to its lateral margins; and these two ridges are united by a transverse ridge situated at some distance from but parallel to the anterior margin. Three longitudinal grooves occur on the area defined by these ridges, namely, one in the middle and one on each side, close to the ridges. The elevated parts of the upper surface of the segment are more or less distinctly transversely rugose.

The internal antennæ are shorter than those of *G. nitida* from the Cape Verde Islands, but longer than those of *G. Darwinii*: as in *G. nitida* the terminal joints of the peduncles project beyond the front; but in *G. intermedia* they are much shorter, scarcely measuring more than a fourth of the length of the gastric region. The peduncle bears two subequal flagella, of which the interior one is a little longer and much thicker than the other. The external antennæ are a little longer than the carapace, and are similar to those of *G. Darwinii*. Their peduncles are scarcely longer than those of the internal antennæ, and their joints are short, resembling those of the species from Port Darwin; the antepenultimate joint is armed at the distal end of its upper margin with a minute spinule, and the last two joints are clothed above with long hairs. The outer maxillipeds project somewhat more forwards than the peduncle of the external antennæ.

The chelipedes are equal to one another and about once and a half as long as the carapace; in their outer appearance they seem to resemble those of the species from the Cape Verde Islands. The laterally compressed meropodites project nearly as much forwards as the peduncles of the internal antennæ; they are everywhere smooth and glabrous, except the internal margins of their narrow under surfaces, which are armed along their whole lengths with a row of minute equal spinules, about 25–30 in number, and fringed with very long hairs. Some few short hairs are also found along the external margins of their under surfaces and at the distal ends of their upper surfaces. The wrists are short, and armed with two rather strong, acute, subequal spines, one at the distal end of the upper margin, and the other at the distal end of the under margin; the latter sometimes bears another much shorter spinule at its base, which, however, is often indistinct. The upper surface of the wrist is covered with two rows of hairs, and some hairs are also found on its under surface. The hands are a little distorted, but otherwise seem to resemble those of *Gebiopsis nitida*. They are as broad at their proximal halves as the meropodites, and the fingers are much shorter than the palm, being only half as long. The palm, rounded above and below, is smooth and unarmed, but clothed with hairs, some of which are arranged in longitudinal, often oblique, rows. The equally long fingers cross one another with their pointed tips when closed; the mobile finger is strongly curved, very hairy, and armed at the base of its inner margin with a small tooth, whereas the immobile finger is nearly glabrous and minutely denticulate along its inner margin.

The second legs resemble those of *G. nitida*; the meropodites, which are much narrower than those of the chelipedes, are fringed with long hairs along their inferior margins; the propodites are a little longer than the carpopodites, and nearly three times as long as the dactylopodites, which are therefore apparently shorter than those of *G. nitida*, but about the same size as those of *G. Darwinii*. The upper margin of each carpopodite and propodite, and also the under margin of the latter, is fringed with long hairs, similar to those of the inferior margin of the meropodites; each dactylopodite is also hairy.

The meropodites of the third pair of legs are, again, narrower than those of the second pair (in the species from the Cape Verde Islands, on the contrary, they are figured as being broader) and nearly glabrous, being not fringed with long hairs; the carpopodites of these legs are a little longer than the propodites and somewhat hairy at their distal ends. The outer surfaces of the compressed propodites are covered with two dense rows of hairs; and each of these joints is, moreover, clothed with a dense tuft of hairs at the distal end of their under margin, and with a few hairs along its upper margin. The hairy dactylopodites are a little more than half as long as the propodites. The equally compressed propodites of the fourth pair of legs are a little shorter than the carpopodites and scarcely longer than the dactylopodites; and the outer surface of each is also covered with two dense rows of hairs, as on the propodites of the third pair, and a similar dense tuft of hairs is found at the distal end of the under margin of each.

The last pair of legs of this species are very characteristic, and more resemble those of the proper *Gebiæ*, the propodites being slender and not compressed. They are, moreover, subcheliform, the inferior margin of each propodite being prolonged into an acute immobile finger, which, however, is much shorter than the dactylopodite. Their somewhat thickened meropodites are even a little shorter than each of the two following joints, and the carpopodites are nearly as long as the propodites, whereas they are almost twice as long as the latter in *G. Darwinii*. The dactylopodites measure nearly half the length of the propodites. The meropodites, carpopodites, and propodites of these legs are a little curved; the meropodites are glabrous, the carpopodites clothed with a tuft of hairs at the distal ends of their upper margins, and the propodites are clothed with hairs in the same manner as the legs of the third and fourth pairs.

The rami of the uropoda are broad, and resemble those of *G. Darwinii*. They are as long as the terminal segment of the postabdomen, and their posterior margin, like the external margin of the outer rami, is fringed with hairs; the upper surfaces of the outer rami present two longitudinal ridges proceeding from the base of the joint to the posterior margin, and that of the inner rami one ridge.

The largest specimen, a male, is 39 millim. long from the tip of the front to the posterior margin of the terminal postabdominal segment; the cephalothorax of this specimen is 12½ millim. long, and the chelipedes measure 19 millim.

Family THALASSINIDÆ.

Genus THALASSINA, *Latr.*

145. THALASSINA ANOMALA, *Herbst.*

Cancer anomalus, *Herbst, Krabben und Krebse*, iii. p. 45, Taf. lxii. (1803).

Thalassina scorpionides, *Latreille, Gen. Crust. et Ins.* i. p. 51 (1807), *nec Guérin et Milne-Edwards.*—See *Steenstrup et Lütken, Videnskabelige Meddelelser*, p. 257.

One old specimen was collected at Mergui, where the species is very common. In it the distance of the tip of the beak to the end of the terminal segment measures about 27 centim. The hands are nearly equal in shape and size, and the cardiac region is armed with some spines.

Thalassina anomala has been recorded from the Nicobar Islands, Java, Borneo, the Philippine and Fiji Islands.

Family SCYLLARIDÆ.

Genus THENUS, *Leach*.

146. THENUS ORIENTALIS, *Fabr.*

Scyllarus orientalis, *Fabricius, Suppl. Entom.* p. 399.

Thenus orientalis, *Milne-Edwards, Hist. Nat. des Crustacés*, p. 286; *Desmarest, Considérations sur la Classe des Crustacés*, pl. xxxi. fig. 1.

Five specimens were collected in the Mergui seas.

Thenus orientalis inhabits the Indian Ocean.

Family ALPHEIDÆ.

Genus ALPHEUS, *Fabr.*

147. ALPHEUS BREVIROSTRIS, *Oliv.*

Palæmon brevirostris, *Olivier, Encyclop. Méthodique*, t. viii. p. 664, pl. 319. fig. 4.

Alpheus brevirostris, *Milne-Edwards, Hist. Nat. des Crustacés*, t. ii. p. 350.

Alpheus malabaricus, *Hilgendorf, Monatsber. d. k. preuss. Akad. d. Wiss. Berlin*, Nov. 1878, p. 832 (nec *Alpheus malabaricus*, de Haan).

An adult specimen was collected at Elphinstone Island, and a young one in King Island Bay.

This species is most closely allied to *Alpheus malabaricus* (Fabr.), de Haan, and *A. Kingsleyi*, Miers, both from Japan. These three species form a small section of the genus, which may be distinguished from the other species of *Alpheus* with a spiniform rostrum, rounded ocular hoods, and having the basal joint of the outer antennæ without an external spine, by the upper margin of the larger hand being notched, and by the lower being entire. Mr. Kingsley is wrong in uniting *A. rapax* (Fabr.), de Haan, to this section, as in it both margins of the larger hand are entire.

The larger specimen is 66 millim. long from the tip of the rostrum to the end of the terminal segment of the abdomen. The first (*i. e.* the anterior) joint of the internal antennæ measures only a third of the length of the second joint, and the latter is twice as long as the third or antepenultimate joint. The antennal scale is a little longer than the peduncle of the internal antennæ, the difference in length being almost equal to the length of the first (anterior) joint of the antennules; the peduncle of the external antennæ is also shorter than the antennal scale.

The rostrum is acute and short, not reaching as far forwards as the anterior end of the antepenultimate (or third) joint of the antennules; between the eyes it is very narrow, linear, and carinate, being separated from the eyes by rather deep depressions in the surface of the carapace. The rostrum extends but little backwards behind the eyes, so that its whole length scarcely measures a fifth of the length of the carapace. The outer maxillipeds, clothed with long hairs at their extremities, project much beyond the antennal scales, almost reaching to the middle of the thickened portion of the outer (upper) flagella of the internal antennæ.

The larger chelipede, situated on the left side and about 50 millim. long, is more than twice as long as the carapace, but shorter than the distance from the tip of rostrum to the end of the terminal segment of the abdomen. The upper margin of the arm, in both chelipedes, is unarmed, and never presents a spine at itsdistal end; the inner margin of the under surface, however, presents some small acute teeth along its whole length, the distal oneo fwhich is the longest of all, especially on the larger (or left) chelipede. The larger hand, which is almost three times as long as broad, and which measures 30 millim., is strongly compressed laterally, and has a prismatic form. The fingers are distinctly shorter than the palm; the mobile finger measures 13 millim., and the upper margin of the palm 17 millim., so that the fingers are a little shorter than half the length of the whole hand. The outer surface of the palm is smooth and glabrous, and has no longitudinal crests, although it appears slightly concave at the base of the immobile finger. The inner surface of the palm is also smooth, but is clothed with some hairs, especially along its upper and under margins. The upper margin of the palm is flattened, especially on its distal half, and is bordered by two longitudinal and parallel crests, of which the external one, however, scarcely extends proximally beyond the oblique impressed line at the base of the outer surface of the hand, whereas the internal crest is a little longer. Immediately before the articulation of the mobile finger, a small transverse groove occurs on the upper surface of the palm, as in *Alpheus malabaricus* (Fabr.), de Haan. The under, like the upper, margin of the palm is flattened; so that an under surface may be spoken of. As already observed, the inner margin of this under surface is bordered with rather long hairs The mobile finger is strongly compressed laterally, and is broad and bluntly rounded at its distal extremity; the elevated proximal half of the inner margin of the immobile finger is fringed with rather long hairs on the inner side of the hand, and the outer and inner surfaces of the fingers are also a little hairy.

The other leg measures 39 millim, is much shorter than the former, and scarcely twice as long as the carapace. The hand of this smaller chelipede is 22½ millim. long, the palm measuring 8½ millim., so that the fingers are only once and a half as long as the palm. The palm is compressed and fringed with long hairs along the upper and under margins of its inner surface; the fingers are slightly arcuated and present a space between their inner margins, which are densely clothed with rather long hairs, and the tips cross when closed.

The joints of the carpus of the second pair of legs are respectively 4¾, 3¾, 1⅕, 1⅕, and 1⅖ millim. long; the first or proximal joint is therefore the longest of all, and even a little longer than the second, and the latter is nearly as long as the three distal joints together.

The younger specimen, which is only 34 millim. long from the tip of the rostrum to the end of the terminal segment of the abdomen, presents only two slight differences from the adult worthy of notice. The rostrum, as in the adult *Alpheus rapax* (Fabr.), de Haan, extends backwards nearly to the middle of the carapace, and the antennal scales scarcely project beyond the peduncles of the internal antennæ. This specimen in other respects perfectly resembles the adult.

This species is closely allied to the Japanese *Alpheus malabaricus* (Fabr.), de Haan, and *A. Kingsleyi*, Miers. It differs at first sight from *A. malabaricus*, as described in the 'Fauna Japonica,' by the absence of the longitudinal crests on the outer surface of the larger hand, and by the fingers of the smaller hand being comparatively shorter in proportion to the length of the palm. In *Alpheus Kingsleyi*, Miers, the fingers of the larger hand are nearly as long as the palm, those of the smaller chelipede about twice as long as the palm, and the upper surface of the palm of the larger hand does not present the characteristic crests of *A brevirostris*.

A. brevirostris appears to inhabit the Indian Ocean, having been collected by Péron on the coast of New Holland and at Zanzibar by Peters, according to Dr. Hilgendorf, who, however, was wrong in referring it to de Haan's *A. malabaricus*.

I am more inclined to refer de Haan's *A malabaricus* to the *malabaricus* of Fabricius than the *A. brevirostris*, as that part of Fabricius's description of his species, viz " palma minuta, digitis longissimis," is much more applicable to the species which was described by de Haan than to *A. brevirostris*. Nevertheless I am not aware whether the species described in the 'Fauna Japonica' under the name of *A. malabaricus* really occurs in the Indian Seas.

148. ALPHEUS RAPAX (*Fabr.*), *de Haan*

Alpheus rapax, *de Haan*, *Fauna Japonica*, *Crustacea*, p. 177, tab. xlv. fig. 2.

A fine, nearly adult specimen was collected in King Island Bay.

Though closely allied to the preceding species, *A. rapax* of the 'Fauna Japonica' may be distinguished from it by the following characters —The rostrum, even in the adult, extends backwards to the middle of the carapace. The arms of both chelipedes are armed with an acute spine at their distal ends, both margins of the palm of the larger hand are entire (as may also be distinctly seen in de Haan's figure), and the fingers of the smaller hand are somewhat longer in proportion to the palm, being twice and a half as long as the palm in the adult, whereas in *A. brevirostris* they measure only once and a half the length of the palm. Finally, it is not the first joint of the carpus of the legs of the second pair that is the longest of all, but the second joint. In other respects this species almost completely resembles *A. brevirostris*, for the crests with which the outer surface of the larger hand should be provided, according to the author of the 'Fauna Japonica,' may be perhaps visible in very old specimens; in younger individuals, such as the one before me, they are, however, rather indistinct. De Haan himself describes the upper crest of the outer surface as "valde obtusa evanida."

The specimen is 55 millim. long from the tip of the rostrum to the end of the terminal segment of the abdomen, and had doubtless not yet reached its full size. The rostrum extends nearly to the middle of the carapace; its acute tip projects nearly as much forwards as in *A. brevirostris* scarcely reaching beyond the middle of the antepenultimate joint of the peduncle of the internal antennæ. The rostrum is acute between the eyes, and is separated from them by rather deep depressions, behind the eyes, however, the rostrum is not acute, but rather obtuse. As regards the length of the joints of the internal antennæ, *A. rapax* fully agrees with *A. brevirostris*, the scale of the external antennæ in the specimen scarcely projects beyond the peduncle of the internal antennæ. The outer maxillipeds resemble those of *A. brevirostris*, and equally project forwards.

The right chelipede is the larger, as in the figure of the 'Fauna Japonica,' and is 39 millim long. It therefore appears more than twice as long as the carapace, but shorter than the whole body—quite as in *A. brevirostris*. The upper margin of the arm of each chelipede is armed with a small acute spine at its distal end; the inner margin of the upper surface presents some small teeth, of which the distal one is the longest, resembling those of the preceding species. The larger hand is 22½ millim. long, and 7¾ millim. broad near its base, so that it is about three times as long as broad; also in the length of the fingers this species agrees with *A. brevirostris*. The shape of the larger hand is nearly quite the same in both species, but in *A. rapax* no transverse groove is found on its upper surface, close to the articulation of the mobile finger. I may add that in this specimen the inner surface of the palm is nearly glabrous.

The smaller hand is similar to that of *A. brevirostris*, but the palm is comparatively shorter in proportion to the length of the fingers, the whole hand being 18½ millim. long, the upper margin of the palm 5½ millim., and the fingers 13 millim.; in this specimen the fingers therefore are more than twice as long as the palm.

The joints of the carpus of the legs of the second pair are respectively 8½, 8¾, 1¾, 1½, and 1⅘ millim. long; the second joint therefore is the longest of all, and even a little longer than the first. This fact is clearly recognizable in the figure in the 'Fauna Japonica.' Mr. de Haan was probably right in identifying his specimens with the species of Fabricius, the diagnosis of the latter agreeing also perfectly with this specimen.

A. rapax is a rather rare species, inhabiting the Indian Ocean, and the seas of China (*Stimpson*) and Japan (*de Haan*).

149. ALPHEUS EDWARDSII, *Aud.*

Athanasus Edwardsii, *Audouin, Explication planches de Savigny, Description de l'Egypte, Atlas*, pl. x. fig. 1.

Alpheus avarus, *de Haan* (*nec Fabricius*), *Crustacea, Fauna Japonica*, p. 179, pl. xlv. fig. 3 (Alpheus bis-incisus *on plate*).

Alpheus crassimanus, *Heller, Crustaceen der Novara-Reise*, S. 107, pl. x. fig. 2, var.

Alpheus Edwardsii, *Miers, Report on the Zoological Collections made in the Indo-Pacific Ocean, during the Voyage of H.M.S. 'Alert,'* 1884, p. 284 (*with all the synonyms there recorded*).

No fewer than thirty-five specimens of different size were collected, both males and females, namely, twenty specimens at Owen Island, ten in King Island Bay, four young individuals at Elphinstone Island, and one young specimen at Sullivan Island.

Mr. Miers deserves the thanks of carcinologists for having elucidated the synonymy of this almost cosmopolitan species, and I perfectly agree with him in the opinions he has expressed. I therefore not only regard *A. avarus*, de Haan, *A. strenuus*, Dana, and *A. leviusculus*, Dana, as identical with Savigny's species, discovered in the Red Sea, but also with Heller's *A. crassimanus*, described in the 'Novara Reise.' *

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* Dr. Kossmann, when referring Red-Sea specimens to *A. crassimanus*, observes that the hands of his specimens did not perfectly agree with Heller's figure. This may be easily explained by the fact that in the figure of the 'Novara-Reise' the smaller hand has been figured, whereas Dr. Kossmann erroneously regarded it as the larger (Kossmann, Zoolog. Ergebnisse einer Reise nach dem Rothen Meere, p. 82).

Mr. Miers has not only given a new description of this species in his report, but he has also made many interesting remarks on its variations. I have therefore little to add to what has been said by him. In the typical specimens the second joint of the carpopodite of the second leg is precisely half as long as the first joint, or scarcely exceeds half the length of the latter, as is proved by the following measurements, which express in millimetres the length of these joints in eight specimens:—

Mergui Specimens

Male specimens.			Female specimens.		
Whole length of the carpopodite	First joint.	Second joint	Whole length of the carpopodite	First joint.	Second joint.
7½	3⅓	1⅔	8	3⅖	1⅘
6	2⅓	1¼	6¼	2½	1⅗
			6⅓	2⅓	1⅙
			5¼	2	1¼

Red-Sea specimens

6½	2½	1⅓	6¾	2⅛	1¾

A variety sometimes occurs, in which the second joint is scarcely shorter than the first, as is proved by the following two female specimens, from the Mergui Archipelago:—

Whole length of the carpopodite	First joint.	Second joint.
14	4½	4⅓
7	2⅖	2⅕

It was a specimen belonging to this variety which was figured in the 'Novara Reise.'

In most specimens the lobe or tooth, which occurs immediately behind the notch on the upper and under margins of the larger hand, is rounded or subacute, but rarely very acute, as is proved by a specimen from the Mergui Seas.

I can also record the existence of a variety of the smaller hand of the male, described by Miers, characterized by the upper margin of the palm being more or less distinctly notched, whereas it is smooth and entire in the type; the lower margin, however, sometimes presents a trace of a slight notch. This variety, which occurs in two specimens in the collection, has been figured by Heller, *l. c.* pl. x. fig. 2.

In very large specimens the interocular portion of the rostrum appears more distinctly carinate than in younger individuals.

The largest individual of the collection is 58 millim. long from the tip of the rostrum to the end of the terminal segment, and its larger hand is precisely half as long, measuring 29 millim. In this specimen the carpopodite of the second leg measures 14 millim., whereas the two first joints have about the same length.

The other specimens are mostly of medium size, measuring 30–35 millim., but two of them are only 10 millim. long.

A. Edwardsii not only inhabits the whole Indo-Pacific, but also a part of the Atlantic region. It has been observed in the Red Sea, the whole Indian and Pacific Ocean to the west coast of America, and on the eastern coast of this continent from North Carolina to the Abrolhos (Brazil).

150. ALPHEUS HIPPOTHOË *, n. sp. (Pl. XVII. figs. 1–5.)

Three adult specimens of this interesting form were collected, a male and an ova-bearing female at Sullivan Island, and another male in King Island Bay.

A. Hippothoe is most closely allied to *A. parvirostris*, Dana, and to *A. Edwardsii*, Aud., in its general appearance and in the structure of its anterior legs; but it may be readily distinguished from the former by the basal joint of the outer antennæ presenting no trace of an external spine, and from *A. Edwardsii* by the meropodites of the legs of the third and fourth pairs being armed with a short acute spine at the distal ends of their inferior margins.

The body closely resembles that of *A. Edwardsii*, Aud., the common Indian species. The rostrum is short, acute, and reaches a little beyond the middle of the first joint of the peduncle of the upper antennæ. As in *A. Edwardsii*, it arises from the front margin of the carapace; the interocular portion, however, is more distinctly carinate than in specimens of *A. Edwardsii* of the same size, being much compressed and separated by rather deep grooves from the orbits, which are unarmed. This inter-

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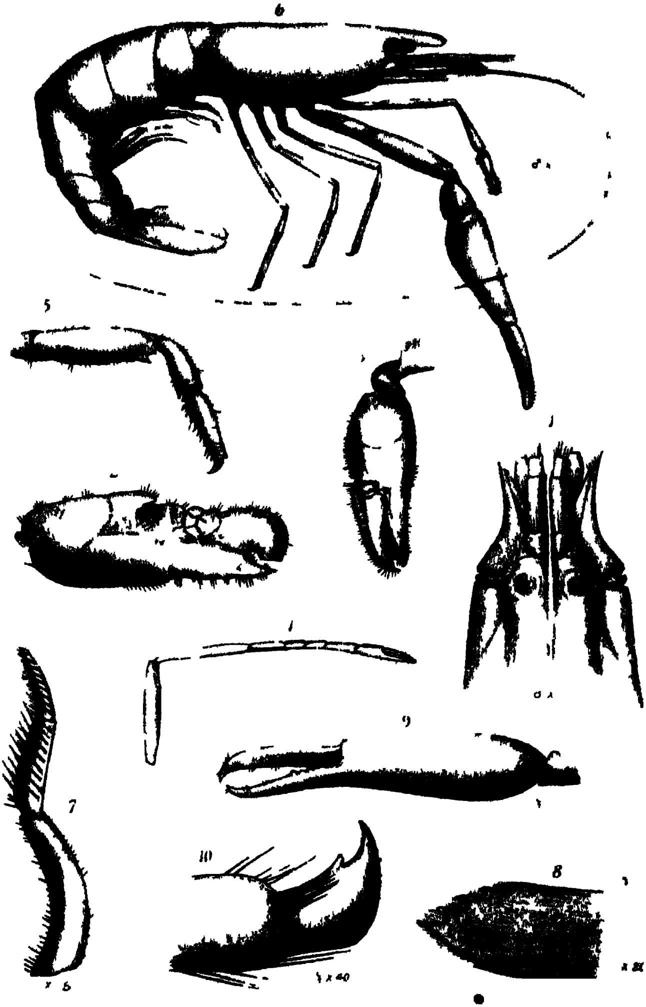
* *Hippothoë*, one of the Nereids.

Mergui Exped. Linn. Soc. Journ. Zool. Vol. XXII. Pl. 17.



Michael lith. D. De Man del. Mintern imp.

1-5 ALPHEUS HIPPOTHOE. 6-10 HARPILIUS MIERSI.

ocular portion of the rostrum is more or less prolonged backwards, the crest becoming gradually less visible in one specimen to the middle of the cephalothorax, but in the other two not so far. The upper surface of the cephalothorax is rounded and minutely punctate.

The postabdomen, and more especially its terminal segment, closely resembles that of *A. Edwardsii*, the terminal segment being armed on its upper surface with two pairs of minute spines; whereas in Audouin's species this upper surface is glabrous, it is more or less hairy in this species.

The two pairs of antennæ of *A. Hippothoe* are closely similar to those of *A. Edwardsii*, and differ from those of *A. parvirostris*, Dana, in the complete absence of an external spine on the basal joint of the outer antennæ. The second joint of the peduncle of the inner antennæ is about once and a half as long as the first, and the third is a little shorter than it; the peduncle is a little hairy. The peduncle of the outer antennæ is as long as, or scarcely longer than, that of the inner antennæ, and the basal scale, which is narrowed considerably towards the apex, and whose external more solid part terminates anteriorly in a spine, comparatively a little longer than in *A. Edwardsii*, is as long as the peduncle. The outer maxillipeds resemble those of *A. Edwardsii*, but they are a little longer, and project with a larger or smaller portion of the terminal joint beyond the antennal peduncles.

In their outer appearance, the legs present a striking resemblance to those of *A. parvirostris*, Dana, the legs of *A. Edwardsii* being more slender. The arms of the anterior legs are equal and unarmed at the distal ends of their upper margins; in *A. Edwardsii* the internal margin of the under surface is armed at the distal end with a small spine; but in this species a proper spine does not occur there, although the distal end terminates in a sharp point. The carpopodites are quite similar to those of *A. Edwardsii*. As regards its shape and structure, the larger hand of *A. Hippothoe* is intermediate between that of *A. Edwardsii* and that of *A. parvirostris*, for whereas the hand is less slender than in Audouin's species, the proportion of its length (the fingers included) to its breadth being exactly the same in this species and in *A. parvirostris*, the distal half of the hand in this species is more contracted and narrower than in *A. parvirostris*, resembling in this character *A. Edwardsii*. The hand is rounded at its proximal end, and notched on its upper as on its lower margin. The upper margin of the palm, as in *A. Edwardsii*, terminates in an obtuse tooth immediately behind the notch, whereas such a tooth is not found behind the notch of the lower margin. The triangular depression on the inner, the quadrangular depression on the outer surface, and the impressed line on the proximal portion of the palm closely resemble those of *A. Edwardsii*. As I have already observed, the distal half of the hand, which lies beyond the notches of the upper and lower margins, is narrower in this species than in Dana's *A. parvirostris*, and resembles that of *A. Edwardsii*. The mobile finger is comparatively shorter than in *A. Edwardsii*, and is probably more like that of *A. parvirostris*, its upper carinate margin being still more rounded and circular. The inner surface of the hand is hairy, especially towards the fingers, which are also slightly hairy on their outer surfaces; the mobile finger is a little longer than the other, and, as in *A. Edwardsii*, is armed near the base on its inner margin with a strong rounded tooth fitting into a deep pit on the lower finger. I may add that the larger hand is comparatively thicker than that of *A. Edwardsii*.

The smaller hand is also comparatively less slender than that of *A. Edwardsii*; and, like the larger hand, it is also slightly thicker, and perfectly resembles the smaller hand of *A. parvirostris*. The rounded upper margin of the palm, which is marked at its proximal portion with a similar impressed line to that which also occurs on the larger hand, presents a slight trace of a notch immediately before the articulation of the mobile finger; but the lower margin is entire. The fingers are as long as, or slightly longer than, the palm, and perfectly meet together when closed, leaving no interspace between them; they have the same length, and their tips cross one another. The inner margins of the fingers are slightly excavated. The mobile finger of *A. Hippothoë* presents the same form in the male and in the female, whereas in *A. Edwardsii* the mobile finger of the smaller chela of the male has quite a different form from that of the female. In this species the mobile finger is slightly longitudinally carinate above, along its whole length, and both edges of its inner concave margin are continuous; the oblique rows of hairs with which the mobile finger of the smaller hand of the male of *A. Edwardsii* is covered above are wanting in *A. Hippothoë*. The inner edge of the internal concave margin of the immobile finger is continuous from the base to the tip, but the outer edge is obliquely interrupted a little before the middle. The convex inner surface of the smaller hand is covered with many hairs, especially towards the fingers, which are very hairy on their inner surfaces.

The other legs closely resemble those of *A. parvirostris*. As regards the structure of the carpopodites of the second legs, this species resembles *A. Edwardsii*. The first joint is a little more than twice as long as the second, and a little shorter than the other four joints taken together; the third and fourth joints are very short and equal, each being half as long as the second joint; the fifth joint is longer than the preceding, but still a little shorter than the second joint; in the largest specimen those joints are respectively 3¾, 1½, ¾, ¾, and 1⅓ millim. long, in the youngest example 2⅔, 1¼, ⅝, ½, and ⅘ millim. In the largest specimen the hand is a little shorter than the last three joints of the wrist taken together, in younger specimens it is slightly longer; the fingers are constantly a little longer than the palm, whereas in *A. Edwardsii* they are as long as, or even slightly shorter than, the palm.

The form of the legs of the third and fourth pair is very characteristic of this species, and resembles that of *A. parvirostris*; they are, indeed, less slender than those of *A. Edwardsii*, and the meropodites are armed at the distal ends of their inferior margins with an acute spine which is not found in Audouin's species. These legs are a little hairy and the propodites are armed along their inferior margins with two or three rows of small spines. The legs of the fifth pair are also a little less slender than those of *A. Edwardsii*, which they otherwise resemble. The uropoda are almost exactly similar to those of Audouin's species, being armed at the base with two acute spines, and the outer rami present two or three spines at the external angle of their posterior margins. The largest specimen is 28 millim. long from the tip of the rostrum to the end of the terminal postabdominal segment. In the second specimen, likewise a male, the larger hand is 13½ millim. long, and 6 millim. broad; whereas in a specimen of *A. Edwardsii* the larger hand, presenting a similar breadth of 6 millim., is 15⅔ millim. long, appearing therefore comparatively more slender than that of *A. Hippothoe*.

151. ALPHEUS MINOR, *Say*.

Alpheus minus, *Say, Journ. Acad. Nat. Sci. Philad.* vol. i. p. 245 (1818); *Milne-Edwards, Hist. Nat. Crustacés*, t. ii. p. 356.

According to Mr. Miers, this species, discovered by Say on the eastern coasts of North America, occurs also in the Indo-Pacific region. He was able to compare typical specimens from East Florida with specimens from the Indian Seas, which belonged to *Alpheus neptunus*, Dana, and observed no other differences between them than "that the ocular spines and the rostrum are somewhat shorter and more triangulate in the Floridan examples than in the Oriental form" (Zoology of H.M S. 'Alert,' 1884, p. 288); he therefore united *Alpheus neptunus* with the species described by Say, regarding it as a variety of the latter. I acquiesce in his opinion, and moreover also regard Stimpson's *A. biunguiculatus* from the Sandwich Islands as a variety of the very variable *Alpheus minor*

Although I suspect that *A tricuspidatus*, Heller, from the Red Sea, and *A. Charon*, Heller, from the Red Sea and the Nicobar Islands, may also prove to be only varieties of Say's species, I cannot at present decide this question, as there are no specimens at my disposal which present the characters of these two forms.

151*a*. ALPHEUS MINOR, var. NEPTUNUS, *Dana*.

Alpheus neptunus, *Dana, United States Expl Exp , Crustacea*, i. p. 553, pl. xxxv. fig. 5.

Six specimens, viz three males and three females of unequal size, were collected in King Island Bay, and doubtless belong to this species. All the female specimens are provided with eggs; the largest of them measures 21 millim. from the tip of the rostrum to the end of the terminal scale, whereas the smallest is only 15 millim. These individuals present the following characters:—

The ocular spines and the rostrum are of equal length and extend to the middle of the first (or antepenultimate) joint of the peduncle of the internal antennæ. The second joint of the latter is scarcely longer than the first, but is distinctly longer than the third joint. The distal half of the terminal joint of the outer foot-jaw projects beyond the peduncle of the external antennæ. The rounded upper margin of the palm of the larger hand is armed at its distal end, above the articulation of the mobile finger, with a short acute spine. The first joint of the carpopodite of the second legs is even a little longer than the four other joints together, the second, third, and fourth joints are very short and of equal length, the fifth is nearly as long as the third and the fourth taken together; the hands are scarcely longer than the last two joints of the carpopodite taken together, the palm being a little shorter than the fingers and a little shorter also than the terminal joint of the wrist. The inferior margins of the meropodites of the legs of the third pair are armed with four or five spinules along their distal halves; the meropodites also of the legs of the fourth pair present one to three similar spinules in the middle of their inferior margins, but the meropodites of the last pair of legs are unarmed. The dactylopodites of the legs of the last three pairs are biunguiculate, the acute claw being armed on its upper or external margin with a second, much smaller claw.

Alpheus minor, var. *neptunus*, has been hitherto collected in Japanese and Chinese Seas (Island of Ousima, Hongkong), in the Sooloo Sea (Dana), at Port Jackson (Eastern Australia), in the Red Sea (Suez), and at Ceylon, so that this variety appears to be distributed throughout the Oriental Seas.

151 *b*. ALPHEUS MINOR, var. BIUNGUICULATA, *Stimps.*

Alpheus biunguiculatus, *Stimpson, Proc. Acad. Nat. Sci. Philad.* 1860, p. 31.

Three other specimens collected at Sullivan Island are doubtless examples of *Alpheus biunguiculatus*, Stimps., viz.: an adult ova-bearing female and two small males. The female specimen is 21 millim. long. In these specimens the claws of the last three pairs of legs are biunguiculate, as in *A. neptunus*, but differ from it in the smaller claw being placed on the under or internal side of the larger, and by the inferior margins of the meropodites of the legs of the third and fourth pairs being unarmed. The other characters of *A. biunguiculatus* mentioned by Stimpson are wholly absent in these specimens or only partially present. Thus the upper margin of the palm of the larger hand in two specimens (the adult female and one male) is unarmed, but in the third specimen (the small male) it is armed at its distal end with a spine similar to that found in *A. neptunus*. The joints of the carpopodite of the second legs have precisely the same length as in *A. neptunus*. The joints of the peduncle of the internal antennæ perfectly agree with Dana's figure of *A. neptunus* (pl. xxxv. fig. 5*a*), the second joint being distinctly shorter than the first, whereas in the six specimens referred above to *A. neptunus* the difference is much smaller. In one of our examples the ocular spines and the rostrum have the same length, extending, as in *A. neptunus*, to the middle of the first joint of the peduncle of the internal antennæ; but in the two other specimens the rostrum projects a little more forwards than the ocular spines, but it does not reach the distal end of the first joint.

I regard this form also as a variety of *Alpheus minor*, Say, because the foregoing species vary in some of their characters, as I have demonstrated above; and it is also possible that the two characters above mentioned may prove to be variable, when a sufficiently large series is examined. *Alpheus tricuspidatus*, Heller, from the Red Sea is probably identical with *A. biunguiculatus*.

Alpheus biunguiculatus was discovered by Stimpson at the Sandwich Islands amongst Madrepores.

Genus NICA, *Risso*.

152. NICA MACROGNATHA, *Stimps.*

Nica macrognatha, *Stimpson, Proc. Acad. Nat. Sci. Philad.* 1860, p. 26.

Two very young specimens were collected at Owen Island. Although they are in a very bad and mutilated condition, there can be little doubt that they belong to Stimpson's species, which was discovered at Hongkong. The rostrum, which is a little shorter than the eyes, is rather lamellate and appears acute when seen from above. The external maxillipeds are wanting in both specimens. The armature of the longitudinally sulcated terminal somite of the abdomen wholly agrees with the description quoted above. The didactyle anterior leg is a little shorter than the monodactyle, and its carpopodite is about as long as the palm (not shorter than it), whereas the fingers are shorter than the palm.

Genus HARPILIUS, *Dana*.

153. HARPILIUS MIERSI, n. sp. (Pl. XVII. figs. 6–10.)

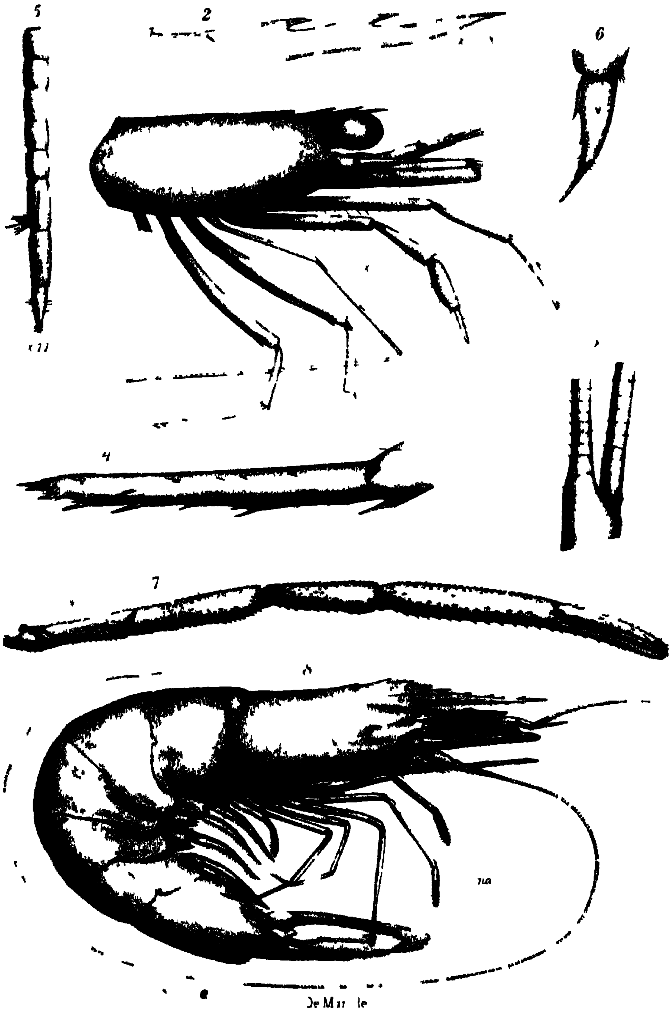
Two adult specimens, a male and an ova-bearing female, were found at Elphinstone Island.

This most interesting species, which I dedicate to the author of the important Report on the carcinological Collections made in the Indian Ocean during the voyage of H.M.S. 'Alert,' presents a remarkable transition between the genera *Coralliocaris* (*Œdipus*, Dana) and *Harpilius*, the small curved claws of the legs of the last three pairs being armed with a small accessory tooth on their inner (inferior) margins, quite as in the genus *Coralliocaris*. But *Harpilius Miersi* is also remarkable, because in general appearance and in many particulars it presents a striking resemblance to two allied species, viz. *Anchistia aurantiaca* Dana, from the Fiji Islands, and *Harpilius inermis*, Miers, from the Australian Seas, especially to the former.

The body of *Harpilius Miersi* is somewhat compressed, especially the postabdomen, which is curved downwards, like that of *Harpilius inermis*; the surface of the body appears smooth to the naked eye, but is really minutely punctate when examined under a magnifying-glass The anterior margin of the carapace is armed with a small antennal spine above the basal joint of the external antennæ. The upper surface of the carapace is rounded. The rostrum is very characteristic: it is strongly compressed, ensiform, longer than the eyes, and reaches to the middle of the penultimate joint of the internal antennæ; in a dorsal view it appears acute at its apex, and much resembles that of *Anchistia aurantiaca*. In a lateral view it appears lamellate, being nearly four times as long as broad; in that position also the denticulation of the rostrum becomes visible by means of a magnifying-glass. The upper margin is almost entire throughout its length, except quite at the distal end (fig. 8), where it is armed with four small acute teeth, placed immediately before the acute tip; the under margin also is almost entire, presenting only one small tooth at the distal end, placed immediately below the second or third tooth of the upper margin; the tooth of the under margin, however, is much smaller than the teeth of the upper margin, and can only be distinguished by means of the microscope. The terminal segment of the postabdomen is rounded above, but gradually and considerably narrows towards its distal end, which bears some setæ; its lateral margins are unarmed. The peduncles of the upper antennæ are longer than the rostrum, which reaches to the middle of their penultimate joint, but are a little shorter than the scale of the external antennæ; the last two joints have almost the same length. The external antennæ are somewhat longer than the body, and the joints of the flagella are naked. Their peduncles are much shorter than those of the antennules, being quite as long as the rostrum; the basal scales are much longer than the peduncles, and even project a little beyond the peduncles of the inner antennæ. The external maxillipeds (fig. 7) are a little shorter than the peduncles of the outer antennæ; they much resemble those of *Palæmonella orientalis* (Dana, *l. c.* pl. xxxviii. fig. 4 *d*), as regards the relative length and breadth of the joints. The terminal joint is a little shorter than the penultimate, and the last two joints together are a little longer than the antepenultimate joint, which is but little broader than the penultimate, being much less dilated than in the typical species of the genus, *Harpilius lutescens*, Dana.

The anterior legs are slender, and, with the distal halves of their carpopodites, project beyond the antennal scales; the carpopodite, which is gradually somewhat thickened towards its distal end, is a little shorter than the arm, and but little longer than the hand; whereas in *Harpilius inermis*, Miers, it is about twice as long as the hand. The palm is a little shorter than the hairy fingers.

The somewhat unequal chelipedes of the second pair are closely similar to those of *Anchistia aurantiaca*, Dana, and are much longer and larger than the anterior legs, being almost twice as long as the carapace. The meropodites are a little longer than the ischiopodites, and nearly twice as long as the carpopodites, which are very short, still shorter than those of *Anch. aurantiaca*. The hands (fig. 9) much resemble those of the latter species. The palm is rounded above and below, and is much swollen at its base and thicker than the carpopodite, the difference between both joints being greater than in *Anchistia aurantiaca*; the palm towards its distal end being slightly compressed. The fingers are strongly compressed and are a little longer than half the length of the palm, but shorter than half the length of the whole hand. Their tips are pointed, somewhat curved and hairy, and have thin inner edges. The mobile finger is scarcely longer than the other, and is armed at the base of its inner edge with two or three teeth; the index, on the contrary, presents eight or nine teeth of equal size at the base of its inner edge, much smaller, however, than the teeth of the mobile finger. The remaining part of the inner edges is sharp and unarmed. The fingers of both hands are armed with such teeth, whereas in *Harpilius inermis*



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[illegible] PALAEMON ACUTIROSTRIS [illegible]
[illegible] MERGUIENSIS

Michael lith. Mintern imp.

the teeth of the fingers of the left chelipede are not developed. The chelipedes of the second pair are everywhere smooth and unarmed. The three other legs are slender, unarmed, and closely resemble those of *Harpilius inermis*, but the carpopodites are a little shorter in proportion to the length of the propodites, and the small curved claws (fig. 10) are armed with a small acute tooth at their inner margins, as in the genus *Coralliocaris*, Stimps. (= *Œdipus*, Dana).

The uropoda perfectly agree with those of *Harpilius inermis*, Miers, reaching a little beyond the distal end of the terminal postabdominal segment, and being armed with a curved spine above at their bases. The rami are ovate, ciliated, and the outer are a little broader than the inner.

The larger of our two specimens, the ova-bearing female, is 26 millim. long from the tip of the rostrum to the end of the terminal postabdominal segment, the carapace (with the rostrum) measuring 9 millim. The larger chelipede of the second pair is 17 millim. long, the hand measuring 9½ millim., the palm 6 millim., the fingers 3½ millim.

Genus Hippolyte.

154. Hippolyte oligodon, n. sp. (Plate XVIII. figs. 1–6.)

The collection contains one male specimen of a species of *Hippolyte* which appears to be new; this I now propose to describe under the name of *oligodon*, on account of the small number of teeth with which the rostrum is armed. This specimen was found at Elphinstone Island; but, unfortunately, it is somewhat mutilated, having lost a part of the flagella of the two pairs of antennæ, and also some legs.

The rather slender animal is about 28 millim. long, from the tip of the rostrum to the end of the terminal postabdominal segment, the postabdomen measuring 19 millim. This species seems to be most allied to *Hippolyte spinifrons*, M.-Edw., from New Zealand; but may be distinguished from it at once by the ordinary size of the antennal spine on the anterior margin of the carapace, which is small and does not even reach to the middle of the eyepeduncles. In *Hippolyte oligodon*, as in *Hippolyte spinifrons*, the postabdomen is straight and not deflexed in the middle, whilst in most other species of this genus it is suddenly geniculated downwards. The rostrum is spiniform, small, and very acute, and is scarcely longer than the short eye-peduncles, and does not reach to the distal end of the first (antepenultimate) joint of the peduncle of the internal antennæ. It arises from the anterior third of the cephalothorax, with a small carina, which, however, does not extend to the middle of the cephalothorax; the rostrum is quite unarmed below, but armed on its upper margin with three acute teeth, directed forwards. The first tooth is placed on the carapace, at a distance of about a fifth of its length from the anterior margin; the second or middle tooth is found on the rostrum itself, immediately before the anterior margin of the carapace, and the third tooth quite on the middle of the rostrum, its distance from the acute tip being a little longer than its distance from the second tooth (fig. 2). The distance of the first tooth from the second finally is a little longer than the distance of the third to the tip. The anterior margin of the cephalothorax is armed with a small, acute, antennal spine, the point of which is situated quite below the middle of the distance between the tips of the two anterior teeth of the rostrum.

The terminal postabdominal segment tapers gradually and considerably to its distal end, which is truncated, straight, and armed with four spines; the two median spines are a little longer than the posterior margin of the segment and more than twice as long as the lateral spines; the upper surface of the segment is armed with two pairs of small spines, and the distal halves of the lateral margins are ciliated, some ciliæ being also found between the four spines of the posterior margin.

The peduncles of the internal antennæ are as long as, or scarcely longer than, the basal scales of the external antennæ; the first joint is somewhat longer than the rostrum, the second is a little shorter than the first, and the third or anterior joint is scarcely half as long as the second. The first joint is armed at the distal end of its upper margin with two very small spinules, and the second joint with one spinule at its distal end: the flagella are broken in part, so that I cannot describe their length; I may remark, however, that they are thin, the one scarcely thicker than the other, and that each of their joints is provided with one or two very short hairs, which can only be observed by means of a microscope (fig. 3).

The peduncles of the external antennæ are almost as long as those of the internal; their flagella are broken and lost. The basal scales are nearly as long as the peduncles, being but little shorter; they are ovate, ciliated along their internal margins and at their rounded anterior ends, and their external margins terminate anteriorly in a small spinule.

As in *H. spinifrons*, the outer maxillipeds are very elongate and project much beyond the antennal scales, the penultimate joint of which is a little shorter than the terminal joint, extending a little beyond it. The penultimate joint is armed with a small spinule at its distal end; along the upper margin of the terminal joint (fig. 4) four or five similar spinules are observed, and four or five spinules occur also at the terminal, obliquely truncated end of the joint. The last two joints are ciliated, the ciliæ being partly arranged in transverse rows. The equal, rather slender, anterior legs do not extend so much forward as the outer maxillipeds, being shorter than them and quite unarmed, although a little hairy. The meropodites are slender and project as much forwards as the eyes; the carpopodites are a little longer than half the length of the meropodites, and gradually appear a little thicker towards their distal ends. The hands (the palm and the fingers taken together) are a little longer than the carpopodites; the fingers are shorter than the palm, measuring two thirds of it, and are provided with some small tufts of short hairs.

The second legs are filiform and longer than the outer maxillipeds. The ischiopodites of these legs extend forwards nearly to the anterior margin of the carapace; the meropodites are a little longer than the ischiopodites, and reach almost to the distal end of the antennal scales or the middle of the penultimate joint of the external maxillipeds. The carpopodites, which are 8½ millim. long, are twice as long as the meropodites, and almost as long as the carapace (the rostrum included); they are divided into 24 or 25 joints; the terminal joint (fig. 5) is twice as long as the other joints, and presents a small tuft of hairs close to its articula[illegible]n with the hand. The other joints of the carpopodite are naked. The hands (the palm + the fingers) are as long as the three terminal joints of the carpopodite taken together; the palm is nearly as long as the terminal joint of the wrist; and the somewhat hairy fingers are a little shorter than the palm.

The other legs are partly broken, so that I can only add the following. The meropodites of the legs of the third pair extend as much forward as those of the legs of the first pair, and are armed with a small spinule near their distal ends. The propodites are also armed with a similar spinule, about in their middle. The legs of the fourth pair reach to the distal end of the antennal scales; their meropodites also are armed with a small spine near their distal ends; the propodites are about once and a half as long as the carpopodites, and armed with a row of four spinules along their inner margins. The dactylopodites finally (fig. 6) have the ordinary form, being nearly straight, scarcely arcuate, pointed and acute, and each is armed at its base on its inner margin with a small spinule. The legs are very sparsely covered with a few hairs.

The uropoda are a little longer than the terminal segment of the postabdomen, and their inner ovate rami are ciliate.

Genus PALÆMON, *Fabr*

155. PALÆMON CARCINUS, *Fabr.*

Palæmon carcinus, *Fabricius, Suppl Entom.* p. 402; *Milne-Edwards, Hist. Nat. Crust.* t. ii. p. 395; *de Man, "On some Species of the Genus* Palæmon, *Fabr.," in Notes from the Leyden Museum,* i. p. 165.

One very young specimen only was collected at Mergui. It is still smaller than the specimen which I described in the "Notes from the Leyden Museum," for it is only 45 millim. long from the tip of beak to the end of the terminal segment. This specimen, however, wholly agrees with that in Leyden, the carpopodite of the second pair of legs being twice as long as the palm, and the first pair of legs projecting a little beyond the appendages of the antennæ.

Palæmon carcinus has been recorded from the mouth of the Ganges, from Singapore, Sumatra, Borneo, the Philippines, Java, Celebes, and Siam.

156. PALÆMON ACUTIROSTRIS, *Dana.* (Plate XVIII. fig. 7.)

Palæmon acutirostris, *Dana, Unit. States Expl. Exp. Crustacea,* i. p. 590, pl. xxxix. fig. 1.

The collection contains seven specimens of this species, which was discovered at the Sandwich Islands. Six were captured at King Island, in fresh water, the seventh at Elphinstone Island. The few points in which these specimens differ from Dana's description in his 'Conspectus' and from his figures (the text is not at hand) are so unimportant that I do not regard them as examples of any other species but *P. acutirostris*. If, however, further research should prove that the species from the Sandwich Islands is a distinct species, then the Mergui specimens should certainly be referred to Stimpson's *P. boninensis*.

The largest specimen, a male, is 85 millim. long from the tip of the rostrum to the end of the terminal postabdominal segment. In this specimen the carapace is a little rough anteriorly, being covered with minute spinules, arranged irregularly and only visible with a magnifying-glass; on the posterior half of the cephalothorax these spinules are not found, the upper surface being only minutely punctate. In the other younger specimens these minute spinules are much less numerous, being still only observed on the antero-lateral parts of the carapace, or they are even quite absent, the cephalothorax then being smooth.

The rostrum is characteristic. It is quite similar to that of *P. superbus*, Heller (Novara-Reise, Taf. x. fig. 10), but in this species it is generally shorter than the antennal scales and not longer. In most specimens, as, indeed, in the largest, the rostrum does not reach to the end of the antennal scales, being a little shorter than these appendages, but it exceeds the peduncles of the internal antennæ: in the smallest individual, which is only 40 millim long, the rostrum is even a little longer than the antennal scales; whereas in the specimen from Elphinstone Island it is only just as long as the peduncles of the internal antennæ. In most specimens it is a little convex above the eyes and slightly directed downwards at the distal end, sometimes, however, it is a little curved upwards towards the latter. The rostrum is $\frac{12-13}{3-4}$ toothed; in the largest specimen the formula is $\frac{13}{4}$, in four other specimens $\frac{12}{4}$, and in the specimen from Elphinstone Island the rostrum is $\frac{12}{3}$ dentate. In the specimens which were collected by Dana at the Sandwich Islands the formula was $\frac{14-16}{4-5}$, but this difference may be regarded at most as indicating a local variety. The teeth of the upper margin are small and nearly equidistant; the first four teeth are placed on the carapace behind its anterior margin, the first tooth is found at a distance of a third of the length of the cephalothorax from its anterior margin and the teeth occur quite to the tip of the rostrum. (In Dana's figure 1 *a'* six teeth are shown as occurring behind the anterior margin of the carapace, but this figure is certainly incorrect, twenty teeth having been figured on the upper margin.)

The external maxillipeds are of moderate length, being only a little longer than the peduncles of the external antennæ, projecting with their terminal joint beyond them. In the largest specimen the anterior legs project much beyond the antennal scales, exceeding them by the anterior fourth part of their carpopodites; in the youngest individuals, however, they are still longer than the antennal scales, but only project by the greater half of the hand beyond them. The carpopodites are nearly twice as long as the hands (the palm and the fingers taken together). In the largest specimen the legs of the second pair, which are much stronger than those of the first pair, are a little unequal, the right being the larger. The larger leg, measuring about 75 millim., is still a little shorter than the body; the arm does not reach to the anterior end of the antennal scales, but to about the middle of the carpopodite of the anterior legs, and the latter project as much forwards as the carpopodite of the larger leg. The carpopodite, measuring 13 millim., is a little shorter than the arm and a little shorter than half the length of the hand (the palm and the fingers taken together); it measures about two thirds of the length of the palm. Like the arm and the wrist, the palm also is nearly cylindrical, and longer than the fingers, the latter being as long as the wrist and measuring two thirds of the length of the palm.

The slender fingers (13 millim. long) are quite close together, except at their basal thirds, where they are a little gaping; and here they are each armed with two or three small teeth, but they are provided with a thin acute edge along the two distal thirds of their inner margins. The other leg resembles the larger one, differing only by its smaller size. Both legs are very scabrous and rough, being covered with numerous small acute spinules, which are much larger along the under surface of the joints than on their upperside. The joints also are covered, though very sparsely, with minute hairs.

In the smaller specimens, as in one that measures about 55 millim., the legs of the second pair are also already unequal, the right being the larger. The arm of the larger leg, however, now only projects its smaller anterior half beyond the peduncle of the outer antennæ and the carpopodite half its length beyond the antennal scales. In these specimens the joints of the legs of the second pair present almost the same proportions as in the largest specimen, and the fingers are of a fine blue colour with white tips.

As regards the other legs, I may add that those of the third pair are quite as long as the antennal scales, and that those of the fifth pair do not project so much forwards, reaching only to the distal end of the peduncles of the internal antennæ. These legs are also minutely scabrous. The propodites of the legs of the fifth pair are still a little longer than the meropodites and about twice as long as the carpopodites.

The species with which our *P. acutirostris* is most closely allied are the following:—

(1) *Palæmon asperulus*, v. Mart., from Shanghai, seemingly differs from *P. acutirostris* in its rostrum, having only two or at most three teeth of the upper margin situated behind the anterior margin of the carapace; by the carpopodite of the anterior legs being comparatively shorter, and by the carpopodites of the legs of the second pair being not shorter than the arm.

(2) *P. boninensis*, Stimps., from the Bonin Islands. This form is scarcely different from *P. acutirostris*, and may perhaps prove to be merely a local variety.

(3) *P. japonicus*, de Haan, which differs from it by the shorter fingers of the larger hand of the second pair, which are precisely half as long as the palm, and by some other characters.

(4) *P. brevicarpus*, de Haan, also from Japan. In this form the fingers of the larger hand of the second pair are quite as long as the palm.

P. acutirostris, Dana, has hitherto, so far as I know, been only recorded from the Sandwich Islands.

157. PALÆMON EQUIDENS, *Dana*.

Palæmon equidens, *Dana, United States Expl. Exped., Crustacea*, i. p. 591, tab. XXXIX. fig. 2.

Four specimens collected in fresh water I refer to *P. equidens*, Dana. Unfortunately all these specimens have lost their second pair of legs, except one male, in which one of the legs, probably the smaller one, has been preserved; I can therefore add little to Dana's description.

The formulæ for the teeth of the rostrum of these four specimens are: $\frac{9}{4}$, $\frac{9}{5}$, $\frac{10}{4}$, and $\frac{10}{7}$; so that the formula is $\frac{9-10}{4-7}$. The first two teeth are placed on the carapace behind the anterior margin, the third tooth exactly above it; the rostrum is more or less curved upwards towards the apex. The specimen, in which one of the second legs has still been preserved, is 72 millim. long from the tip of the rostrum to the end of the terminal scale. The leg of the second pair is 51 millim. long; the arm (8½ millim. long) projects almost as much forward as the external maxillipeds, thus a little more than the peduncle of the external antennæ; the carpopodite (13 millim. long) is about once and a half as long as the arm and somewhat thickened towards its distal end; the hand (18½ millim. long) is almost once and a half as long as the carpopodite, the palm (11 millim.) is a little shorter than the carpopodite, and the fingers measure nearly two thirds of the length of the palm. They meet together along their whole length; and both fingers are provided on their inner margins with a thin acute edge; the mobile finger presents, moreover, two minute teeth at its base, and the other finger one, opposite those of the mobile finger. The whole leg is minutely scabrous and rough, being covered by small spinules.

The legs of the first pair project with their hands beyond the antennal scales, the hands being half as long as the wrists. The legs of the third pair project as much forward as the rostrum; and the other legs are scarcely shorter.

The other specimens are about the same size; but this species, according to Dana, attains a length of 120 millim.

P. equidens has hitherto been only recorded from Singapore, and is still a very insufficiently known form. The species from Mauritius, which Heller referred to *P. equidens* (Heller, Sitzungsber. kais. Akad. der Wiss. in Wien, Bd. xlv. p. 418, Taf. ii. fig. 44) is certainly a different species, distinguished by the carpopodite of the larger hand being shorter than the palm. *P. Idæ*, Heller, may perhaps prove to be identical with Dana's *P. equidens*.

Family PENÆIDÆ.

Genus PENÆUS, *Fabr.*

158. PENÆUS SEMISULCATUS, *de Haan.*

Penæus semisulcatus, *de Haan, Fauna Japon., Crustacea*, p. 191, tab. xlvi. fig. 1; *Miers, "On the Penæidæ," Proc. Zool. Soc. London*, 1878, p. 299.

Two adult specimens were collected in the Mergui Archipelago. They measure about 24 centim. from the tip of the rostrum to the end of the terminal segment of the postabdomen. Mr. Spence Bate, in his critical examination of the Penæidæ (Ann. & Mag. Nat. Hist., 1881, vol. viii. p. 178), comes to the conclusion that this species and *P. indicus*, M.-Edw., are mere varieties of *P. monodon*, Fabr. This may be so; but it appears to me even more probable that *P. semisulcatus*, de Haan, is identical with *P. monodon*, Fabricius, because the diagnosis of the latter agrees perfectly with that of the former; but *P. semisulcatus* is probably distinct from *P. indicus*, the typical specimen of which has been figured by Spence Bate, though both species are apparently closely allied. *P. indicus* probably differs from the species of the 'Fauna Japonica' by the following characters:—Although the rostrum presents the same form in both species, being slightly elevated at the extremity, it is constantly armed in *P. semisulcatus* with three teeth at its lower margin, but in *P. indicus* with four or five; and the posterior tooth is placed a little more backwards in regard to the hepatic spine in the former than in the latter. In the second place, I may observe that the lateral sides of the cephalothorax of *P. semisulcatus* present a horizontal crest, close to and immediately below the deep hepatic sulcus (described for the first time by Hilgendorf), proceeding towards the antennal scales, which does not seem to occur in *P. indicus*, according to the figure of this species given by Spence Bate. I may also add that in *P. semisulcatus* the antennal sulcus* is very deep in its posterior portion, as is also the hepatic sulcus, but the gastrohepatic sulcus is faintly defined, as has been already pointed out by Miers. The third postabdominal segment is not keeled in either of these specimens, and the median dorsal keel of the fourth segment does not even extend to its anterior margin; I therefore presume that Mr. Miers is wrong in describing the third to the sixth segment as keeled.

The rostrum in both specimens is $\frac{8}{3}$- and $\frac{7}{3}$-dentate. I may add that the flagella of the internal antennæ have both nearly the same length, being a little longer than the peduncle, *i. e.* the distance from the distal end of the terminal joint of the peduncle to the anterior margin of the carapace. The upper or external flagellum is a little broad and grooved along the proximal third of its length; whereas the remaining part, like the other flagellum, is cylindrical. This structure, as we know, is more completely developed in the genus *Solenocera*, in which the whole upper flagellum is broader than the other, and hollow on its inner side.

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* I here follow the terminology of Stimpson.

Penæus semisulcatus, de Haan, has been recorded from the Red Sea (Djeddah, *de Man*), Mozambique (*Hilgendorf*), Pondicherry, Calcutta, the Chinese and Japanese Seas, the Philippines, the Fiji Islands, and from North Australia. It appears, therefore, to be an inhabitant of the whole Indo-Pacific region.

159. PENÆUS SCULPTILIS, *Heller*.

Penæus sculptilis, *Heller, Crustaceen der Novara-Reise*, p. 122, Taf. xi. fig. 1.

Two fine adult female specimens were collected in the Mergui Archipelago. The larger specimen measures 140 millim. from the tip of the rostrum to the end of the terminal segment of the postabdomen, and therefore appears still larger than the specimens of the 'Novara' Expedition. These individuals agree perfectly with Heller's description and figure, except in the length of the flagella of the upper antennæ. In them the flagella of the internal antennæ are a little shorter than their peduncle; but Heller figured them as longer than it. Perhaps this difference of length may be a sexual character, and I therefore call attention to it.

The surface of the cephalothorax appears minutely punctate when seen under a magnifying-glass. The upper margin of the rostrum, which extends as much forward as the antennal scales and is slightly convex above the eyes, and somewhat curved upward at its styliform acute extremity, is armed with eight teeth in the specimens, and in the 'Novara' specimens with nine; but this difference is certainly individual. The posterior tooth is placed immediately before the hepatic spine, when both are compared with one another, and is separated by more than twice the ordinary distance from the preceding. The dorsal median crest, which extends from the base of the rostrum to the posterior margin, is distinctly canaliculated.

The dorsal median carinæ of the first and second segments are rather obtuse; each consists of two small, parallel, longitudinal ridges, situated close to one another; the carinæ of the other segments gradually appear more acute. The telson is deeply longitudinally grooved, but is not armed with spinules on its lateral margins.

The first and second pairs of legs are unispinose at the bases, and there are no spines on the third pair. In the larger specimen, which is apparently an adult, the legs of the third pair extend to the distal end of the penultimate joint of the internal antennæ, being longer than the peduncle of the external antennæ.

This species is apparently closely allied to the Indian *P. monoceros*, Fabr., but especially to the Japanese *P. curvirostris*, Stimps. *P. Hardwickii*, Miers, is probably a mere variety of *P. sculptilis*; for it differs from it only by its rostrum being a little more elevated at its extremity, and by the first two post-abdominal segments being not at all carinate.

P. sculptilis has been found also on the shores of Java.

160. PENÆUS MERGUIENSIS, n. sp. (Pl. XVIII. fig. 8, and Pl. XIX. fig. 1.)

As I have already observed (p. 285), I suspect *P. monodon*, Fabr. will prove to be identical with *P. semisulcatus*; for de Haan's description agrees perfectly in all its characters with those of the 'Fauna Japonica,' and because *P. semisulcatus* is now known to occur also in the Indian Ocean.

The species which I now intend to describe is certainly different from *P. semisulcatus*, and the distinctive characters between both forms will be enumerated below. This new species, however, is also closely allied to *P. esculentus*, Hasw., from Sydney, and to *P. indicus*, M.-Edw. (=*P. carinatus*, Dana ?), but nevertheless it appears to me to be different. The most striking characters of *P. merguiensis* are furnished by the rostrum and by the antennæ, especially the internal.

Seven fine specimens (5 ♂, 2 ♀) were collected in the Mergui Archipelago. The largest specimen and the smallest are females, whereas the five males are of an intermediate and nearly equal size.

The rostrum in most specimens extends quite as far forwards as the antennal scales, projecting a little beyond the peduncles of the internal antennæ; in the largest specimen, however, it is much shorter, reaching only to the distal end of the penultimate joint of the peduncles of the upper antennæ; in the smallest specimen, on the contrary, (a female), it projects even a little beyond the antennal scales. These are, however, only individual differences. The rostrum is styliform in its distal half, very acute, and projects straightly forwards, being never curved upward towards its extremity; it is continued backwards into a short ridge which does not attain the posterior margin of the carapace, and which in most specimens is slightly flattened or even slightly sulcate for a part. The rostrum is $\frac{7-8}{4-5}$ dentate, the formula being in three specimens $\frac{8}{4}$, in two $\frac{8}{5}$, and in the two remaining $\frac{7}{4}$; the first tooth, *i. e.* its point, is placed a little before the middle of the cephalothorax, and constantly a little behind the hepatic spine, whereas in *P. indicus* this spine is found precisely below, and not before, the point of the first tooth of the rostrum. The distance of the first tooth from the second is a little longer than the distance between the second and the third; the intervals between the other teeth of the upper margin slightly increase distally, the most anterior tooth being separated from the apex of the rostrum by an interval which is as long as, or even a little shorter than, that which separates it from the preceding. The teeth of the lower border are smaller than those of the upper; their intervals also increase slightly in length, and the foremost stands closer to the apex of the rostrum than the foremost tooth of the upper border. Whereas the distal half of the rostrum is styliform, the proximal half which is found on the carapace is more or less elevated into a high crest, characteristic of our species.

The antennal and the hepatic spines are both very small, much smaller than those of *P. semisulcatus*; other spines are not found on the carapace. The antennal and the hepatic sulci are very deep in *P. semisulcatus*, whereas in this species they are faintly defined, especially the latter. The gastro-hepatic sulcus is also faintly defined, just as in *P. semisulcatus*.

The first, second, and third segments of the postabdomen are rounded on their dorsal surfaces; the fourth is keeled, but the keel occurs only on the posterior two thirds of the dorsal line; the fifth and the sixth segments are also carinate, the acute keel of the sixth terminating posteriorly in a short acute tooth. The terminal segment is unarmed and provided with a rather deep longitudinal groove on the middle of its dorsal surface. The first, second, fourth, and fifth segments are marked with a small notch on each side posteriorly. The "ventral plate" of the female much resembles that of *P. indicus*, M.-Edw. (Spence Bate, *l. c.* pl. xii. fig. 5), but is somewhat less distinctly circular;

the internal longitudinal margins are curved upward, as in *P. indicus*.

The internal antennæ are closely similar to those of *P. semisulcatus*; but the internal flagellum is a little shorter than the external. The peduncle is constantly a little shorter than the antennal scales. The external flagellum is much longer than the peduncle, *i. e.* the distance between the distal end of the terminal joint and the frontal margin of the carapace, and when laid backwards it reaches to nearly the first tooth of the rostrum; as in *P. semisulcatus*, this flagellum is broad and hollowed along the proximal third of its length. The inner or under flagellum is cylindrical and shorter than the other, and does not reach to the anterior margin of the carapace when laid backwards. The length of the flagella of the internal antennæ distinguishes this species at first sight from the Australian *P. esculentus*, Hasw. The flagella of the outer antennæ are almost twice as long as the whole animal.

The external maxillipeds are longer in the male than in the female: in the male they are as long as the peduncle of the internal antennæ, and reach almost to the distal end of the antennal scales; whereas in the female they are much shorter, and scarcely extend beyond the distal end of the antepenultimate joint of the peduncle.

The legs of the first pair are a little longer than the peduncle of the external antennæ, but do not project beyond the eyes; their carpopodites are nearly once and a half as long as the hands (the palm and the fingers taken together). They are armed with a spine on the under surface of their second joints, and with another spine on the under surface of their third joints, just as in *P. semisulcatus*, de Haan, and in *P. esculentus*, Hasw.

The legs of the second pair scarcely reach to the distal end of the penultimate joint of the peduncles of the internal antennæ; their carpopodites are hardly more than twice as long as the hands, and they are armed with a spine on the under surfaces of their second joints. The legs of the third pair are the longest of all; in the largest specimen they scarcely extend beyond the antennal scales, but in the male specimens the fingers almost reach beyond them. Their carpopodites, in the largest specimen, are precisely twice and a half as long as the hands, but in the younger specimens they are a little more. The legs of the fourth pair are a little longer than the peduncle of the external antennæ;

their carpopodites are scarcely twice as long as the depressed lanceolate dactylopodites. The last legs are nearly as long as and similar to those of the fourth pair.

The rami of the uropoda are much longer than the terminal segment of the postabdomen, and are quite similar to those of *P. semisulcatus.*

The largest specimen is about 20 centim. long from tip of rostrum to the end of the terminal segment of the postabdomen.

P. merguiensis differs from *P. semisulcatus*, de Haan, (1) by the form and structure of the rostrum; (2) by the postrostral ridge not proceeding backwards to the posterior margin of the carapace, and being much less distinctly sulcate; (3) by the faintly defined antennal and hepatic sulcus; (4) by the absence of the horizontal crest on the antero-lateral surface of the cephalothorax, which in *P. semisulcatus* is found below and parallel to the hepatic crest, being directed towards the peduncle of the outer antennæ; (5) by the inner flagellum of the upper antennæ being shorter than the external one. *P. merguiensis* also differs from the Australian *P. esculentus*, Hasw., by its straight rostrum, which is armed with more teeth, by the faintly defined gastrohepatic sulcus, and at first sight by the much longer internal antennæ. It also differs from the still imperfectly known *P. indicus*, with which *P. carinatus*, Dana, is probably identical, by the shape of its rostrum; by the somewhat shorter flagella of the internal antennæ, of which the external one seems not to be dilated at base; by the much shorter flagella of the external antennæ; by the form of the ventral plate; and probably by some other characters.

161. PENÆUS LYSIANASSA*, n. sp. (Pl. XIX. fig. 1.)

Fourteen specimens (6 ♂, 8 ♀) of this interesting new species were collected in the Mergui Archipelago.

Penæus Lysianassa belongs to that group of species in which the rostrum is shorter than the eyes; and it is apparently closely allied to *P. Richtersii*, Miers, from the seas of Madagascar.

The cephalothorax is scarcely more than twice as long as broad, and is scantily clothed with a short pubescence; some parts of the surface that are slightly elevated are quite glabrous,

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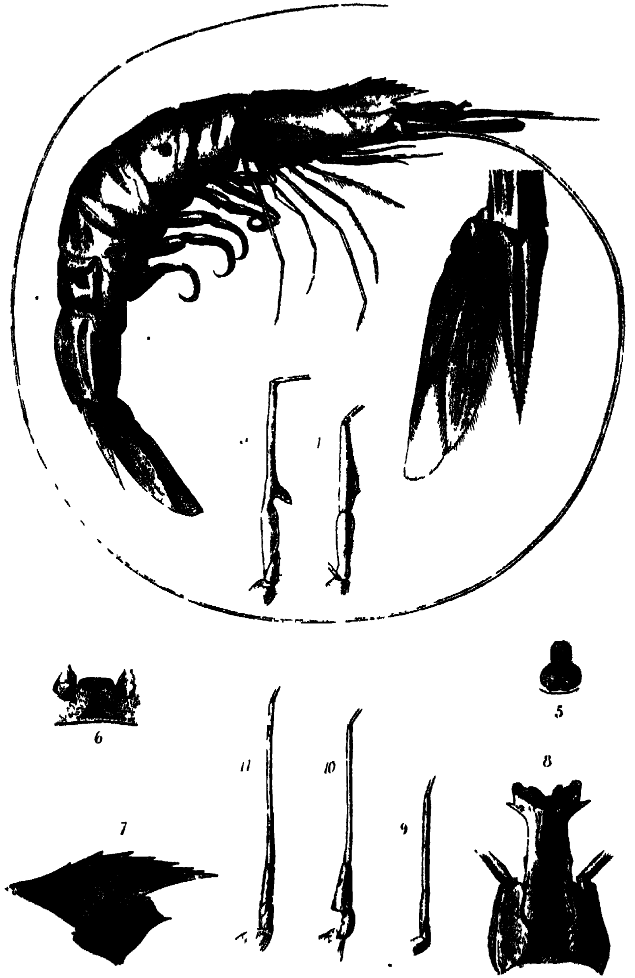
* *Lysianassa*, one of the Sea-nymphs.



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PENÆUS LYSIANASSA

as, *e. g.*, the dorsal median ridge, a lateral longitudinal ridge proceeding from the hepatic spine to the posterior margin, the posterior margin itself, &c., so that the pubescence appears only on those parts of the outer surface which are slightly impressed.

The rostrum is very short, and reaches only halfway to the end of the eye-peduncles; it is strongly laterally compressed, tolerably high, and the lateral surfaces are pubescent. The upper margin of the rostrum is slightly declivous towards the tip, which is acute; it is armed above with six small acute teeth, which gradually decrease in size towards the tip. These six teeth are about equidistant; the anterior tooth is placed close to the tip, and the three posterior ones are situated on the dorsal surface of the carapace, the fourth being placed precisely above the frontal margin; the upper margins of these six teeth are microscopically crenulate and fringed with short hairs. They are preceded by a seventh small acute tooth found at the base of the rostrum, a little before the middle of the cephalothorax. The slightly ascending lower margin of the rostrum is entire and unarmed. The rostrum is continued backwards into a smooth, glabrous, blunt, scarcely elevated ridge, which divides immediately before the posterior margin of the carapace into two ridges, which proceed towards the posterior margin. In *P. Richtersii* the two posterior teeth of the rostrum are situated on the dorsal surface of the carapace.

The anterior margin of the cephalothorax is armed with an acute antennal spine and with a small supraocular tooth; there is also a small hepatic spine. The antennal and hepatic grooves are scarcely indicated; but the gastro-hepatic sulcus, which proceeds from the hepatic spine obliquely upwards and backwards towards the middle of the dorsal median ridge of the carapace, is distinctly marked. The antero-inferior angle of the cephalothorax is not toothed. The eye-peduncles are very short, and scarcely reach to the distal end of the antepenultimate joint of the antennulary peduncles; the latter are a little shorter than the antennal scales. In nearly all these specimens the flagella of the internal antennæ are unfortunately broken off; in a single specimen only are they still partly preserved. These flagella are, as I suppose, about as long as their peduncles; the outer or upper one is much thicker than the other, but it soon tapers a little beyond the tips of the antennal scales. The peduncles of the outer antennæ, concealed, in a dorsal view, by the much longer antennal scales, are a little shorter than the eyes; the naked flagella are nearly twice and a half as long as the cephalothorax, the rostrum included.

The strongly compressed postabdomen is nearly three times as long as the cephalothorax; the slightly impressed parts of its outer surface are pubescent, like those of the cephalothorax, whereas the slightly elevated parts are smooth and glabrous. The first three or anterior segments are smooth and glabrous on the dorsal median line; they are not at all carinate, though a longitudinal pubescent impression is observed on each side of the smooth and glabrous dorsal median line. The lateral surfaces of the postabdominal segments present other and similar impressions, some of which are longitudinal or oblique, whereas others are transverse. The fourth segment is slightly dorsally carinate, but its carina is rather obtuse; the fifth and sixth segments, however, are sharply keeled, and the carina of the sixth segment terminates posteriorly in a short acute angle or tooth, whereas the carinæ of the fourth and of the fifth segments are not at all toothed posteriorly. The posterior borders of the postabdominal segments are entire and smooth; those of the first and second segments present a small notch on each side, those of the fourth and of the fifth a similar somewhat deeper notch. The strongly compressed sixth segment is marked on each side with four longitudinal impressions. The terminal segment is scarcely longer than the sixth, narrow and acuminate; it is dorsally canaliculated along its whole length, and its lateral margins, which are fringed with some hairs, are quite unarmed and not spiniferous; in *P. Richtersii* the lateral margins are each armed with three mobile spines, and the telson is dorsally canaliculated only in its proximal half.

The outer maxillipeds have the same length in the male and female; they are rather short and are quite as long as the rostrum, and somewhat shorter than the peduncles of the external antennæ.

The anterior legs reach only to the distal end of the penultimate joint of the external maxillipeds and of the antennal peduncle; the second joint of these legs, the basipodite, is armed with a spine, but the third is unarmed. The hands are a little shorter than the carpopodites, and the fingers are a little longer than the palm. The legs of the second pair are a little longer than the peduncle of the external antennæ; the basipodites are armed with an acute spine. The carpopodites of these legs are scarcely twice as long as the hands, the fingers of which are about as long as the palm. The third pair of legs, the last of the chelate, are still longer than the two anterior pairs, for they reach nearly to the distal ends of the penultimate joints of the peduncles of the internal antennæ, projecting with the whole hand beyond the peduncles of the outer antennæ. The basipodites of the third legs are also armed with a slender, acute spine, and their carpopodites are slightly longer than twice the length of the hands, the fingers of which are almost as long as the palm.

As in other species of this remarkable genus, the legs of the last two pairs present a different structure in the male and in the female. The legs of the fourth pair of the male are much shorter than those of the third pair, reaching only as far forwards as the anterior legs. The basipodites are unarmed, and the ischiopodites are as short as these joints; the meropodites have a characteristic form. These joints appear suddenly enlarged at their under margins near the proximal fourth of their length, and then again gradually taper towards their distal ends; the breadth of the enlarged part amounts to a fourth of the whole length of the joint. The carpopodites, which are a little shorter than the meropodites, present the usual slender form; the slender propodites are a little shorter than the carpopodites, being slightly longer than half the length of the meropodites. The straight, thin, and acute dactylopodites are only half as long as the carpopodites. The legs of the fifth pair are a little longer than the peduncles of the external antennæ; they are unarmed at their bases, like the legs of the fourth pair. The meropodites, which are slender and extend nearly as far forwards as the hepatic spine of the cephalothorax, present a peculiar notch or excavation near the proximal ends of their under margins; this notch is surmounted by a singular, subacute, slightly curved, lamelliform prominence or tooth. A similar structure has been described by Mr. Spence Bate as being proper to the male of *Penæus affinis*, M.-Edw. (Spence Bate, "On the Penæidæ," 'Annals and Magazine of Natural History,' 1881, vol. viii. p. 179), and, according to him, this peculiar notch is confined in that species to the ischium-joint of the fifth pair of legs, whereas in this species the meropodites are marked with this singular tooth. The slender carpopodites reach to the anterior margin of the cephalothorax, and are a little shorter than the meropodites. The propodites are quite half as long as the meropodites, and the straight, acute dactylopodites are still a little shorter than the propodites.

As regards the female of this species, there is the strange fact that two of the eight female specimens differ slightly from the others by the structure of the last pair of legs and of the "ventral plate." These two specimens, however, completely agree in all other characters with the remaining six individuals.

The fourth pair of legs of the female are as long as in the male, reaching as far forwards as the anterior legs; these legs also fully resemble the corresponding legs of the male, but their meropodites are simple and not enlarged. The fifth pair of legs of both females are about as long as those of the male and are similar to them, but the meropodites are simple and do not present the peculiar notch and the characteristic surmounting tooth of the male. In six female specimens, which I shall speak of as A, the upper margin of the ischium-joint of the fifth pair of legs is dilated into a small, compressed, lamellate, triangular crest, broadest posteriorly and gradually tapering towards the distal end of the joint. In the two other female specimens (B) this crest is wanting, so that the ischiopodite presents the same form as in the male.

The singular organ called by Spence Bate the petasma presents a very characteristic form in *P. Lysianassa*, but so difficult to describe that I refer to the figure. The petasma, which reaches anteriorly to the bases of the second legs, consists of a longitudinal tube which presents a median longitudinal fissure on the posterior surface; the latter is convex anteriorly and slightly concave posteriorly. Each lateral margin of the petasma presents a small triangular prominence about its middle and directed forwards. At its distal end the petasma is armed on each side with two spines or teeth, the proximal of which is very acute, and the anterior surface bears two pairs of dentiform prominences, one pair near the base, the other near the distal extremity.

The rami of the uropoda are narrow, ovate, and much longer than the terminal postabdominal segment; they are slightly pubescent above, and fringed as usual with hairs along the lateral margins. In the male the outer surface of the basal joint of the uropoda presents an oblique notch and another slight emargination is observed near the proximal end of the outer margin of the external urorami. A similar structure is proper to the male of *Penæus affinis*, M.-Edw., according to Spence Bate (*l. c.* p. 179, pl. xii. fig. 6 *v*). In the urorami of the female these notches are quite wanting.

The "ventral plate" of the female lying between the last two pairs of legs, strange to say, presents a different shape in the two forms of females; in the females A, in which the ischium-joint of the last pair of legs is triangularly dilated, the ventral plate is divided by three grooves, which meet one another in the centre, into three multangular smaller plates, a median anterior one and two lateral posterior ones. In the two other females, B, the ventral plate is not divided into secondary plates, the radiating grooves not being found in it.

This species is 60–70 millim. long from the tip of the rostrum to the end of the terminal postabdominal segment.

Penæus Lysianassa differs from *Penæus brevicornis*, M.-Edw., by its much shorter rostrum, by the longer flagella of the internal antennæ, and by many other characters, such as the form of the petasma, &c.

The Japanese *Penæus lamellatus*, de Haan, of which I have seen a type specimen from the Leyden Collection, is a quite different species, which may be recognized at first sight by its larger rostrum, armed with more numerous teeth, by its telson being spiniferous along its lateral margins, by the form of its petasma, &c.

Order **STOMATOPODA**.

Genus Squilla, *Dana*.

162. Squilla nepa, *Latr.*

Squilla nepa, *Latreille, Encyclop. Méthodique*, x. p. 471; *Milne-Edwards, Hist. Nat. Crustacés*, t. ii. p. 522.

Squilla oratoria, *de Haan, Fauna Jap., Crustacea*, p. 223, pl. lx. fig. 2.

Squilla nepa, *Miers, On the Squillidæ, Ann. & Mag. Nat. Hist.* Jan. 1880, p. 25, pl. ii. fig. 13.

One specimen was collected in King Island Bay.

Some time ago, while in Leyden, I was able to compare a typical specimen of *Squilla lævis*, Hess, presented to the

Museum of Leyden by that of Göttingen, with specimens of the common *Squilla nepa*. As these two forms have been united by Mr. Miers, I may remark that in *Squilla lævis*, Hess, the rostral plate bears a median keel, that the lateral processes of the second and third thoracic segments are unilobate (and not bilobate as those of *Squilla nepa*), and that the postero-lateral angles of the carapace are not simply rounded, as in *Squilla nepa*, but project into a rather prominent lobe.

Squilla nepa, Latr., represents the European *Sq. mantis* in the seas of the Indo-Pacific region, having been recorded from the Indian Ocean (Zanzibar, Ceylon, Madras, Singapore), Java, the Philippines, Tahiti, and from the Chinese and Japanese seas. According to Milne-Edwards this species ranges as far as the coast of Chili. Miers mentions it as occurring on the eastern coast of Queensland, Australia, having been found at Port Curtis; but I suppose that it is represented on the south-eastern coast, namely, in the seas of Tasmania and New Zealand, by the closely allied *Squilla lævis*, Hess.

163. SQUILLA RAPHIDEA, *Fabr.*

Squilla raphidea, *Fabricius, Suppl. Entom.* p. 416; *Milne-Edwards, Hist. Nat. Crustacés*, t. ii. p. 524.

Squilla harpax, *de Haan, Fauna Japonica, Crustacea*, p. 222, pl. li. fig. 1.

Squilla raphidea, *Miers, l. c.* p. 27.

Five specimens were collected in the Mergui Archipelago.

Squilla raphidea has been recorded from Zanzibar, Borneo, and the Philippine Islands, and is distributed throughout the whole Indian Ocean, the Malayan Archipelago, and the Japanese seas.

Genus PSEUDOSQUILLA, *Guérin*.

164. PSEUDOSQUILLA PILAENSIS, n. sp.

This interesting species was collected at Elphinstone Island. It appears to be nearly allied to *Pseudosquilla Cerisii*, Roux, a form occurring in the Mediterranean, which constitutes, with the American *Pseudosquilla Lessonii*, M.-Edw., the second section of the genus *Pseudosquilla* in the 'Monograph of the Squillidæ,' published by Miers. This new form, which evidently represents that section in the Indian seas, may be distinguished, however, at first sight, from the two latter species by the dactyli of its raptorial limbs being armed with three spines besides the elongated curved terminal spine, and by the armature of the distal prolongation of the base of the uropoda. But *Pseudosquilla pilaensis* is so much the more interesting, because it forms a transition from the genus *Pseudosquilla* to the genus *Lysiosquilla*, (1) by the eye-peduncles being dilated at the distal end, having the cornea bilobate, (2) by the terminal segment of the postabdomen being transverse, much broader than long.

In its outer appearance this species agrees more or less with the Japanese *Lysiosquilla latifrons* (Fauna Japonica, pl. li. fig. 8). The carapace is but little longer than broad, is little narrowed anteriorly, its antero-lateral angles are rather obtuse, and its postero-lateral ones are broadly rounded. The upper surface is smooth, even when seen under a magnifying-glass, and presents the two ordinary, longitudinal, submedian sutures, which are straight and continuous, from the anterior to the posterior margin, but no transverse cervical suture. As in *Pseudosquilla Cerisii*, the rostral plate terminates in a prominent, acute spine, which projects a little beyond the eyes, though not reaching the distal end of the antepenultimate joint of the internal antennæ; the basal portion of the plate is more than twice as broad as long, and its antero-lateral angles are rather obtuse. The upper surface of the rostral plate is perfectly smooth. The eye-peduncles are short, reaching only to the middle of the antepenultimate joint of the internal antennæ; they are dilated at their distal ends, and the cornea is bilobate, presenting a larger internal and a somewhat smaller external lobe. The internal antennæ have the ordinary length, their peduncles being as long as the carapace; the last joint of the peduncle is a little shorter than the penultimate, whereas in most species of the genus *Pseudosquilla* it is longer. The flagella of the internal antennæ are a little shorter then their peduncles, and the latter does not extend as far forward as the external antennæ, which are a little longer.

The upper surfaces of the four exposed thoracic segments and of the segments of the postabdomen are rounded and smooth; the first exposed thoracic segment is laterally prolonged into a very short acute lobe, constituting the lateral angles of the posterior margin. The two following are laterally rounded, with entire margins, whereas the last presents a very small subacute prominence. The fifth or antepenultimate segment of the postabdomen presents on each side two linear impressions close and parallel to the lateral margins, which are confluent posteriorly. A trace of such an impressed line is found on the fourth segment, but the five anterior postabdominal segments have their upper surfaces perfectly smooth. The postero-lateral angles of the three anterior postabdominal segments are rounded and obtuse, but those of the fourth and fifth segments terminate in an acute spinule. The sixth segment is armed, as usual, with six, longitudinal, very acute spines; those which constitute the postero-lateral angles are the longest, extending most backwards. The distance between the two submedian spines is less than that of the next spine from each of them, and even a little less than the distance between the two lateral spines. The terminal segment is transverse, being much broader than long and about as long as the preceding segment. In its armature this segment much resembles that of the other species of the genus *Pseudosquilla* and appears even to be similar to *Pseudosquilla Lessonii*. The posterior margin is armed with six acute spines, of which the two submedian are mobile and well developed; they are placed close to one another, and no teeth are observed between them. Between the submedian spines and the first lateral ones I observe two small truncate teeth, and a similar small truncate tooth occurs between the first and the second lateral spines.

The upper surface of the segment presents a compressed, elevated, longitudinal, median keel, terminating posteriorly in an acute spine; on each side of the median keel five longitudinal carinæ are observed (the keeled lateral margin being included), of which the first and the third, however, are interrupted, the others being continuous. The first, situated next to the median keel, consists, more properly, of a longitudinal row of three acute spines (that of the left side presenting only two spines); the second lateral carina is continuous, but terminates posteriorly in two small acute spinules, placed one behind the other. The third lateral keel is again interrupted in the middle, the posterior portion terminating in an acute spinule; the fourth lateral keel is continuous, and proceeds upon the external lateral spine of the posterior margin even to its point. The under surface of the terminal segment is armed with four acute spines, two on each side, corresponding with the interstices between the spines of the posterior margin.

The dactyli of the raptorial limbs are armed with three spines besides the elongated, curved, terminal spine. The appendages of the three posterior thoracic limbs are slender and styliform. The distal prolongation of the base of the uropoda is also distinctive of this species. It terminates in a strong spine armed along the proximal half of its inner margin with five acute spines, and having a spine also on its outer margin inserted about on the middle of its distal half. The distal prolongation of the base of the uropoda may therefore also be described as terminating near its extremity in two spines, of which the inner one is twice as long as the outer. In *Pseudosquilla Lessonii* and *P. Cerisii* the inner margin presents only two teeth or spines.

Dimensions:—

	millim.
Length of the whole animal, from the tip of the rostral plate to the posterior margin of the last postabdominal segment	50
Length of the carapace (without the rostrum)	9½
Length of the rostral plate	3½

Genus GONODACTYLUS, *Latr.*

165. GONODACTYLUS CHIRAGRA, *Fabr.*

Squilla chiragra, *Fabricius, Suppl. Entom.* p. 417; *Desmarest, Considérations, &c.* pl. xliii.

Gonodactylus chiragra, *Latreille, Encyclop. Méthodique,* x. p. 473, Atlas, pl. cxxv. fig. 2; *Milne-Edwards, Hist. Nat. Crust.* ii. p. 528; *Miers, Ann. & Mag. Nat. Hist.* Jan. 1880, p. 40.

Twelve, mostly small and young, specimens of this common species were collected, eight at Elphinstone Island, one at Owen Island, one in King Island Bay, and two very young individuals at Sullivan Island.

In one of the specimens from Elphinstone Island the lateral lobes of the rostrum are a little more prominent and somewhat more acute than usual; and in another specimen from the same locality the two submedian longitudinal prominences of the sixth segment of the postabdomen are grown together, being not spiniferous.

Gonodactylus chiragra has been recorded from the Mediterranean (*Milne-Edwards*), the whole Indo-Pacific region (Red Sea, Zanzibar, Natal, Rodriguez, Australia, Philippine and Fiji Islands, Tongatabu), and from the coast of America (Panama).

Order PŒCILOPODA.

Genus LIMULUS, *Müll.*

166. LIMULUS MOLUCCANUS, *Latr.*

Limulus moluccanus, *Latreille, Milne-Edwards, Hist. Nat. Crust.* ii. p. 547.

One specimen was obtained at Mergui in the mud at low water.

167. LIMULUS ROTUNDICAUDA, *Latr.*

Limulus rotundicauda, *Latreille, Milne-Edwards, Hist. Nat. des Crust.* ii. p. 550.

An immature female specimen was collected at Mergui and another at King Island Bay.

This species, like the preceding, inhabits the Malayan Archipelago and the neighbouring seas.

EXPLANATION OF THE PLATES.

PLATE I.

Fig. 1. *Doclea Andersoni*, nat. size. Fig. 2. Lateral view of the hand, × 2.

Fig. 3. *Hyastenus Hilgendorfi*, adult male, × 1½. Fig 4. Lateral view of the body, × 1½, showing the obtuse angle made by the rostral spines with the anterior declivity of the gastric region.

Fig. 5. *Harrovia elegans*, × 3. Fig. 6. Lateral view of the hand, × 3.

PLATE II.

Fig. 1. *Myomenippe granulosa*, adult male, nat. size.

Fig. 2. *Actumnus nudus*, adult female, × 3. Fig. 3. Smaller chela, × 3.

Fig. 4. *Eurycarcinus maculatus*, adult male, × 3. Fig. 5. Lateral view of the larger hand, × 3.

PLATE III.

Fig. 1. *Heteropanope indica*, adult male, × 3. Fig. 2. Lateral view of larger hand, × 3.

Fig. 3. *Heteropanope eucratoides*, adult male, × 3. Fig. 4. Lateral view of chela, × 3.

Fig. 5. *Pilumnus Andersoni*, adult female, × 3. Fig. 6. Lateral view of larger hand, × 3.

PLATE IV.

Fig. 1. *Pilumnus lævis*, × 8. Fig. 2. Lateral view of larger chela, × 7.

Fig. 3. *Neptunus Andersoni*, adult female, × 2. Fig. 4. Natatory leg, × 4.

Fig. 5. *Thalamita prymna*, young male, dorsal view of the frontal and orbital region, × 1½. Fig. 6. Abdomen of an adult male, nat. size.

Fig. 7. *Thalamita spinimana*, adult female, dorsal view of the frontal and orbital region, nat. size.

Fig. 8. *Thalamita Danæ*, adult male, dorsal view of the frontal and orbital region, nat. size. Fig. 9. Abdomen, nat. size.

PLATE V.

Fig. 1. *Goniosoma cruciferum*, dorsal view of the anterior half of the upper surface of the cephalothorax of a male specimen, nat. size.

Fig. 2. *Goniosoma affine*, dorsal view of the cephalothorax of an adult female, × 1½.

Fig. 3. *Goniosoma merguiense*, female, nat. size. Fig. 4. Frontal region of a very young specimen, whose cephalothorax is only 10½ millim. long, × 4.

Fig. 5. *Lucrate affinis*, male, × 2. Fig. 6. Abdomen, × 2. Fig. 7. Larger hand of the male, × 2.

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Fig. 4. *Telphusa carinifera*, × 3. Fig. 5. Lateral view of the hand, × 2.

Fig. 6. *Pinnotheres Edwardsi*, adult female, × 2. Fig. 7. Inferior view of the frontal, antennal, and buccal region, × 5. Fig. 8. View of the distal part of the left external maxilliped, × 10. Fig. 9. Lateral view of the hand, × 4.

PLATE VII.

Fig. 1. *Xanthasia* sp., adult female, × 2.

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Fig. 8. *Gelasimus acutus*, adult male, × 1½. Fig. 9. View of the frontal and antennal region of the orbits and of a part of the external maxillipeds of the same, × 1½.

PLATE VIII.

Fig. 1. *Gelasimus acutus*, outer view of the larger hand, × 1½. Fig. 2. Inner view of the same hand, × 1½. Fig. 3. A variety of the larger

hand, × 1½. Fig. 4. Larger hand of a young male, whose cephalothorax is only 18 millim. broad, × 2.

Fig. 5. *Gelasimus annulipes*, outer view of the larger hand of the adult male, × 2. Fig. 6. Inner view of the same hand, × 2. Fig. 7. A variety of the larger hand of the male, × 2.

Fig. 8. *Gelasimus triangularis*, adult male, × 2. Fig. 9. Outer view of the larger hand of the male, × 2. Fig. 10. Inner view of the same hand, × 2. Fig. 11. Abdomen of the male, × 2.

Fig. 12. *Macrophthalmus Erato*, adult male, × 3. Fig. 13. Inferior view of the cephalothorax, × 3. Fig. 14. Outer lateral view of the larger (right) chela of the male, × 3.

PLATE IX.

Fig. 1. *Dotilla brevitarsis*, adult, × 4. Fig. 2. Outer lateral view of the hand, × 8. Fig. 3. Inferior view of the right half of the cephalothorax, showing the right outer foot-jaw, × 8.

Fig. 4. *Dotilla intermedia*, adult specimen, × 4. Fig. 5. Outer view of the hand, × 12. Fig. 6. Inferior view of the right half of the cephalothorax, showing the outer maxilliped and the orbit of that side, × 8. Fig. 7. Outer view of the hand of *Dotilla sulcata*, Forskål, × 8.

Fig. 8. *Dioxippe orientalis*, adult male, × 4. Fig. 9. Inferior view of the anterior part of the cephalothorax, showing the prominent external angle of the inferior margin of the orbits and the outer foot-jaws, × 4. Fig. 10. Lateral view of the hand of the male, × 3.

Fig. 11. *Metopograpsus messor*, larger hand of an adult male, × 2, outer view.

PLATE X.

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Fig. 4. *Pyxidognathus Deianira*, adult female, × 2. Fig. 5. Inferior view of the cephalothorax, × 3. Fig. 6. Outer view of the larger (left) hand, × 2.

Fig. 7. *Metaplax distinctus*, adult male, × 1½. Fig. 8. Inferior view of the anterior part of the cephalothorax, showing the infraorbital ridge and the maxillipeds, × 3. Fig. 9. Outer view of the larger (right) hand, × 3.

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Fig. 4. *Metaplax elegans*, adult male, × 1½. Fig. 5. Inferior view of the cephalothorax, × 2, showing the infraorbital ridge, the orbits, the outer foot-jaws, &c. Fig. 6. Outer view of the larger hand of the male, × 2.

Fig. 7. *Metaplax intermedius*, × 2. Fig. 8. Inferior view of the anterior half of the cephalothorax, × 3, showing the infraorbital ridge, the orbits, the outer foot-jaws, &c. Fig. 9. Outer view of the larger hand, × 3.

PLATE XII.

Fig. 1. *Sesarma Andersoni*, adult male, × 1½. Fig. 2. Outer view of the larger hand of the male, × 3. Fig. 3. Larger hand of the male, viewed from above, × 3. Fig. 4. Outer view of the meropodite of a leg of the last pair, × 4.

Fig. 5. *Sesarma Melissa*, adult male, × 1½. Fig. 6. Outer view of a chela, × 2. Fig. 7. Chela of the male, looked at from above, showing the ridges of the mobile finger, × 2.

Fig. 8. *Sesarma Dussumieri*, adult male, nat. size. Fig. 9. Abdomen of the male, × 2. Fig. 10. Inner view of the chelipede, × 2. Fig. 11. Outer view of the hand, × 2. Fig. 12. Chela of the male, looked at from above, showing the ridges of the mobile finger, × 2.

Fig. 13. *Sesarma* sp., male, probably young, × 2. Fig. 14. Abdomen of the male, × 3. Fig. 15. Outer view of the hand, × 3.

PLATE XIII.

Fig. 1. *Sesarma Edwardsii*, male, nat. size. Fig. 2. Abdomen of the male. Fig. 3. Outer view of the hand of the male. Fig. 4. Inner view of the same chela.

Fig. 5. *Sesarma Edwardsii*, var. *crassimana*, outer view of the right chela of the male. Fig. 6. Abdomen of the male.

Fig. 7. *Sesarma polita*, adult male, nat. size. Fig. 8. Abdomen of the male. Fig. 9. Outer view of the chela of the male.

Fig. 10. *Clistocœloma merguiensis*, female, × 3.

PLATE XIV.

Fig. 1. *Sesarma Kraussi*, adult male, × 1½. Fig. 2. Abdomen of the male, × 3. Fig. 3. Outer view of the larger (left) hand of the male, × 3.

Fig. 4. *Dromidia unidentata*, var., nat. size. Fig. 5. Outer view of the hand, × 2.

Fig. 6. *Dromidia cranioides*, adult male, nat. size. Fig. 7. Inferior view of the anterior part of the cephalothorax, showing the orbital and antennal regions. Fig. 8. Wrist and hand, in an outer lateral view, so that the small teeth of the inner margin of the upper surface are visible, × 3.

PLATE XV.

Fig. 1. *Porcellana Euphrosyne*, adult female, × 2. Fig. 2. Chelipede, viewed from its internal side, × 2. Fig. 3. Outer view of the hand, × 2.

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Fig. 7. *Diogenes miles*, dorsal view of the anterior part of the cephalothorax, × 4, showing the antennæ, the eye-peduncles, the rostrum, &c. Fig. 8. outer view of the larger hand, × 2. Fig. 9. Left leg of the third pair, × 3.

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Fig. 1. *Clibanarius padavensis*, the animal occupying a shell of *Pyrula vespertilio*, nat. size. Fig. 2. Dorsal view of the anterior part of the cephalothorax, × 2, showing the antennæ, the eye-peduncles, the rostrum, &c. Fig. 3. Lateral view of the hand, × 2. Fig. 4. Dorsal view of the hand, × 2. Fig. 5. Left leg of the third pair, × 2.

Fig. 6. *Gebiopsis intermedia*, lateral view of the whole animal, × 1½. Fig. 7. Outer lateral view of a chelipede, × 4, showing the acute spinules along the infero-internal margin of the meropodite, the two strong spines of the wrist, and the form of the hand. Fig. 8. Left leg of the last pair, lateral view, × 4.

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Fig. 6. *Harpilius Miersi*, male, × 5. Fig. 7. Outer foot-jaw of the male, × 15. Fig. 8. Distal extremity of the rostrum in a lateral view, × 20. Fig. 9. Outer view of the larger hand of the female, × 5. Fig. 10. Dactylopodite and distal extremity of the propodite of the left leg of the fourth pair of the female, × 40.

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Fig. 7. *Palæmon acutirostris*. Larger leg of the second pair, × 1½.

Fig. 8. *Penæus merguiensis*. Lateral view, nat. size.

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END OF THE TWENTY-SECOND VOLUME.

PRINTED BY TAYLOR AND FRANCIS, RED LION COURT, FLEET STREET.

TREASURER's Account for the year from May 1, 1887, to April 30, 1888. (Presented at the Anniversary Meeting, Thursday, May 24, 1888.)

Receipts and Payments of the Linnean Society, from May 1st, 1887, to April 30th, 1888.

Receipts.				£	s.	d.
Balance at Bankers' on 1st May, 1887				321	8	9
Interest on Investments				230	15	1
Admission Fees				246	0	0
Annual Contributions				1167	1	6
Compositions				444	0	0
Sales of Publications —						
Transactions	£195	18	2			
Journals	131	0	9			
Proceedings and Catalogues	2	4	0			
				329	2	11
Donations				258	0	0
Sale of Stock				250	0	0
				£3246	8	3

Payments.				£	s.	d.
Taxes and Insurance				21	3	9
Repairs and Furniture				373	4	1
Coals and Gas				67	9	7
Salaries and Commission				522	9	6
Library:—						
Books	£117	18	4			
Binding	57	18	11			
				175	17	3
Expenses of Publications:—						
Printing	£741	13	3			
Illustrations	595	16	2			
Distribution	68	7	6			
				1405	16	11
Miscellaneous Printing and Stationery				60	10	4
Petty Expenses (including Tea and Postage)				95	4	2
Investments				222	0	0
Balance at Bankers' on 30th April, 1888				302	12	8
				£3246	8	3

FRANK CRISP, *Treasurer.*

Investments on 30th April, 1888.

	£	s.	d.	£	s.	d.
Consols	3510	8	1	3506	0	4
Metropolitan Board of Works 3½ per cent. Stock	1079	11	3	1223	19	1
Great Indian Peninsula Railway 5 per cent. Guaranteed Stock	630	0	0	1039	10	0
Forth Bridge Railway Company 4 per cent. Stock (viz. Mr. Bentham's Bequest as a Library Fund)	450	0	0	558	0	0
				£6327	9	5

The foregoing accounts have been examined and found correct. { WILLIAM CARRUTHERS, JOHN ANDERSON, GEORGE MURRAY, D. MORRIS, W. PERCY SLADEN, } *Auditors.*

May 17, 1888.

NOTICE.

The irregularity in the issue of Numbers of the Journals in sequence is due to separate Volumes being issued concurrently.

Journal of Zoology.

Vol. XX., when completed, will contain **Nos. 116 to 125** inclusive.

Of this Vol. there has been published Nos. 116, 117, and 118.

Vol. XXI.—Devoted to the Fauna of the Mergui Archipelago, when completed will contain **Nos. 126 to 135** inclusive.

Of this Vol. there has been published Nos. 126, 127–128, 129, 130, and 131

Vol. XXII. contains Dr. De Man's Report on the Crustacea of the Mergui Archipelago, commencing **No. 136**; Nos. 136, 137, 138, and 139 have already been published, and the Volume is now completed with the present part 140.

Fellows are requested to compare these statements with their own copies before applying to the Librarian for apparently missing Parts.

For issues of Botany, see Notice on back of the Botanical Journals.

The remaining Meetings of the Society during 1888 will be held on Thursdays as under:—

Nov.	1	December	6
„	15	„	20